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JUAN COMAS ON "'SCIENTIFIC' RACISM AGAIN?"

A Scientific Analysis

By DONALD A. SWAN

The October 1961 issue of *Current Anthropology* contained a lengthy and severe attack by Juan Comas upon the new scientific journal, THE MANKIND QUARTERLY, and upon Dr Henry E. Garrett, Professor Emeritus and former Chairman of the Department of Psychology at Columbia University. While the science of anthropology can only benefit from a free and open discussion, accompanied by a careful consideration of all the available evidence, of the entire subject of race and race relations, it is most unfortunate that so much space in a major scientific journal was given over to what is essentially an emotional diatribe. For as has been ably demonstrated previously, Comas' writings in the field of race science are frequently characterized by "incredibly poor scholarship," "defective logic," and a general lack of "first-hand familiarity with most of the texts he discusses" (1). Although the limitations of space prevent an enumeration of even the more elementary errors, some of Comas' misquotations and misuse of the authorities he cites warrant a closer analysis and review.

(A) *Race and Cerebral Structure*

On page 308 of the October 1961 issue of *Current Anthropology*, Comas quotes from Professor Cornelius J. Connolly's comparative morphological study of the fissural pattern of Negro and White brains, as follows: (2)

> As to racial differences no morphological feature was found to be exclusively characteristic of either the White or Negro brain . . . [although there are differences in the frequencies of morphological features], different frequencies of the features do not enable us to tell the racial provenience of an individual specimen. . . . In any case the retention of primitive morphological features is not known to have any mental correlate.

Unfortunately, by judiciously selecting and combining sentences and parts of sentences from entirely different paragraphs, Comas has contrived the construction of a summary of Professor Connolly's study considerably at variance from the actual conclusions. For

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example, the initial sentence in Comas' quotation was lifted out of context from a paragraph which in its entirety reads as follows (3) (the part omitted being shown in italics):

> As to racial differences no morphological feature was found to be exclusively characteristic of either the White or Negro brain. *It would be quite erroneous, however, to conclude from this fact that cerebral differences do not exist in the two races. There is first of all a difference in the frequencies of morphological features in the sulcal pattern such as has been illustrated for the occipital lobe. The differencies in frequencies combined with other morphological features such as the shape of the brain and the relative size of its parts are of anthropological significance.*

The second sentence in Comas' quotation was constructed by the somewhat curious procedure of taking part of a sentence from the above paragraph, combining it with the opening sentence in the following paragraph, and then ignoring any of Dr Connolly's qualifying statements which tend to contradict Comas' preconceived notions on racial equality. This is easily demonstrated by examining carefully the complete paragraph in Professor Connolly's conclusions (4):

> *But* different frequencies of the features do not enable us to tell the racial provenience of an individual specimen. *There remains the possibility that combinations of morphological features produce a configuration of the fissural pattern typical of each race. There is some foundation for this view. The course of the sulci often differs somewhat in our two series, a fact which is correlated with the shape of the brain. But again many exceptions occur and this feature alone could not serve as a criterion of racial differences. It may be possible, however, by considering the more typical sulcal features in each race together with other morphological features such as the shape of the brain and its parts, form of the temporal pole, etc., to determine the race to which an individual specimen belongs, in a goodly percentage of cases.*

Again in the final part of his quotation, Comas selected one sentence and omitted all of Dr Connolly's preceding observations on racial variations in fissural patterns, as may be seen below (5):

> *The fissuration in our White series is somewhat greater than in the Negro series. Taking the brain as a whole, there is only a slight correlation between the degree of fissuration and size of brain. In small weight differences the lighter brain may be the better fissured.*

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It is obvious from the study of our material that there is a great overlap in the variability of the sulcal features. But it is likewise true that the range of variation is not the same in the two races as represented in our series. In considering each of the lobes of the brain, the description began with the simplest brain in the series, namely, that of a male Negro brain weighing 921 *gm.* (*U.S.N.M.* 229045). *In each lobe the fissural pattern of this brain is very primitive and there is no equivalent to be found in our White series. The same may be said of a female Negro brain weighing* 1056 *gm.* (*U.S.N.M.* 290085) *which is somewhat less primitive but still below the range of the White series.*

It is quite possible that further study of other White brains might show specimens equally primitive as these two Negro brains. In any case the retention of primitive morphological features is not known to have any mental correlate.

Professor Connolly then concluded his summary with a tabular presentation of the weights of the individual White and Negro brains used in his comparative study (6). (The average weight of the 13 male White (German) brains was 1307 grams and that of the 13 male Negro brains was 1201 grams; previously, on a series collected by Professor Hrdlicka, Dr Connolly calculated the mean weight of 36 male White (German) brains to be 1298 grams and that of 36 male Negro brains to be 1198 grams) (7).

By way of background information, it might be added that Professor Connolly's detailed and meticulous study, which compared morphologically the fissural pattern of 30 White and 30 Negro brains, was published in three parts in the *American Journal of Physical Anthropology* (1941-1943) and is generally considered the most outstanding recent work on the subject (8). The three articles examined, respectively: (*a*) The Frontal Lobes; (*b*) The Parietal and Temporal Lobes; and (*c*) The Occipital Lobes. These three articles together with numerous other papers in the same field were later collected and published in a volume entitled *External Morphology of the Primate Brain* (1950) (9). Among these papers was a short chapter entitled "Brain and Race," in which Dr Connolly evaluated his own and other scientific studies on racial differences in cerebral morphology—a chapter pointedly ignored by Juan Comas.

Referring to his own study, Professor Connolly noted a greater degree of fissuration and of anastomosis between the fissures in the brains of the Whites (10). The frontal and occipital regions were relatively larger in the White brains, while the parietal region was relatively larger in the Negro brains (11). The greater weight

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of the White brains was marked to the extent that Dr Connolly noted: "It is apparent that brain weight is a racial character and hence any comparison of brain weight with less tangible qualities should be made within the race" (12). Finally, in evaluating his own research, Professor Connolly concluded (13):

> In the course of the writer's comparative morphological study of the human brain, frequency differences in some morphological features were pointed out and attention also drawn to the form of the lunate in the Negro and White brain and the relative frequency of the types of lunate observed in the two races.
>
> Frequency differences are what one might expect in racial studies of the brain. For just as with external somatic characters no one physical character—not even skin color—is diagnostic of a particular race, but rather the combination of a number of characters, so no particular character of the brain is always diagnostic of the race.

Dr Connolly then proceeded to discuss and analyze the various studies on racial characteristics of the brain, which were made by such eminent anthropologists and anatomists as Sergi (1908), Genna (1924), Bianchi (1934), van Bork-Feltkamp (1933), Kurz (1924), Shellshear (1926), Chi and Chang (1941), and Vint (1934) (14), concluding (15):

> It is apparent from the results of the investigations of various authors, that frequency differences in the fissural pattern as well as in other morphological features occur in the brain of different races. The significance of these differences will be better appreciated when more is known of the functions of the various parts of the brain.

(B) *Race and Cortical Histology*

It is somewhat surprising that in his survey of the scientific literature relating to racial differences in brain structure Comas should overlook Dr F. W. Vint's careful comparative studies of the cortical histology of the brains of European Whites and African Negroes. With regard to racial variations in size and weight, Dr Vint found that the average European White male brain was more than 150 grams (10%) heavier than the average African Negro brain (16). Then in two separate investigations based upon a comparative study of the prefrontal cortex of 35 brains and samples from various parts of the cortex of 100 brains, Dr Vint measured the thickness of the several laminae of the cortex and compared the averages for each of the eight areas of the African

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brains with those given for the corresponding areas of European brains as measured by von Economo. According to Dr J. C. Carothers, the findings may be summarized as follows (17):

LAMINAE	PERCENTAGE DIFFERENCE AS COMPARED WITH EUROPEANS
L. zonalis	+ 9%
L. supragranularis	−16
L. granularis int.	−17
L. infragranularis	− 8
Total Cortex	−15%

Thus, Dr Vint found statistically significant racial differences in the thickness of the frontal cortex—the granular and supragranular layers being thicker in European Whites and the infragranular layer in East Africans (18). According to Professor Gates, the supragranular layer—which was the last to be evolved and in Vint's study was 16% smaller in Africans than in Europeans—is concerned with will, intellect, control, etc. (19). Altogether, the total cortex was 15% thinner in the African Negroes. Furthermore, Dr Vint found a significant simplicity in the convolutional pattern of the Negroes and marked racial differences in the cyto-architecture of the frontal cortex—a paucity of large pyramidal neurons and an excess of small primitive cells in the brains of the East African Negroes (20). In evaluating all these differences, Dr Vint concluded (21):

> Thus from both the average weight of the native brain and from measurements of its pre-frontal cortex I have arrived, in this preliminary investigation, at the conclusion that the stage of cerebral development reached by the average native is that of the average European boy between 7 and 8 years of age.

Professor R. Ruggles Gates, in his analysis of this and similar studies also concluded (22):

> . . . it seems difficult to avoid the conclusion that the brain of Negroes in America and of East Africans is some 10 per cent less than in Europeans. This conclusion is unpalatable to those who affect to think that all races are equal in an evolutionary sense, but mere denial of the facts will no longer meet the case.

(C) *Race and Electrophysiology*

In recent years research workers have also made comparative racial studies of electrical activity in the brain—a field of research

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also ignored by Comas. While electroencephalography is still a relatively new science, enough studies have been made to attempt to correlate brain wave patterns with behavior and personality structure and thus to establish criteria of normality and abnormality (23). In two journal articles published in 1949 and 1951 four French doctors, Gallais, Miletto, Corriol and Bert, reported the results of an electroencephalographic study of 100 apparently normal and healthy African Negro soldiers from the Guinea coast (24). In comparing their results with a study on 3000 apparently normal European subjects, Dr Gallais and his associates found 58% of the Africans electroencephalographically abnormal, in contrast to 13.8% of the Europeans. Dr Carothers summarizes their findings on specific differences in African Negro brain wave patterns as follows (25):

1. 8 Africans showed delta waves at rest;
2. 78 showed visible theta waves in the primary tracing; in 31 of these it was the dominant rhythm in at least one area, and in 11 it was the only basic rhythm;
3. 20 showed spontaneous hypersynchronous bursts;
4. 46 showed paroxysmal anomalies on hyperventilation;
5. 36 showed no response to stroboscopic stimulation;
6. there was a relatively wide diffusion of the alpha rhythm over the cortical surface;
7. there was a relatively large occurrence of low-volt poorly-reacting tracings.

In the first article Dr Gallais and his colleagues interpreted these findings as evidence of "neurone immaturity with a tendence to paroxysmal manifestations;" in the latter article, they inferred a "predominance in cerebral functioning of basal nuclei, with a lability of higher centres favouring paroxysmal manifestations, and which might be due to organic cerebral disturbance from genetic causes (*e.g.* sicklaemia), from malnutrition, or from endemic infectious diseases" (26).

Confirmation of these results was sought in a later study by Dr A. C. Mundy-Castle, of the National Institute for Personnel Research (Johannesburg, South Africa), which compared the brain-wave patterns of 66 normal Bantu Negroes with those of 72 European Whites. Using criteria of abnormality established by the British EEG Society, Dr Mundy-Castle did not find the high degree of African EEG abnormality noted by Dr Gallais. However, he did find statistically significant racial differences within the normal range, with the African Negroes exhibiting (27):

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1. a lower incidence of beta rhythm in the resting record;
2. a higher incidence of little or no response to flicker;
3. a lower mean amplitude of flicker response in the theta band, apparently due to the fact that only 13% of the Africans (as compared with 33% of the Europeans) showed any response;
4. a lower incidence of 3rd subharmonics to flicker;
5. significant differences in the distribution of alpha rhythm, suggesting a more anterior origin of this activity among Africans than Europeans.

(D) *Summary and Conclusions*

In contrast to Comas' selective and cursory analysis of the relationship of race to cerebral size, shape and structure, a summary of the state of qualified scientific opinion in this field—including many of the scientists Comas lists in his bibliography—leads to the following conclusions:

1. Psychologists and anthropologists recognize that the brain is the organ controlling intellectual activities (28), and generally agree that there is a physical basis of intelligence to the extent that brain size and structure are in *some* way related to mental capabilities (29). However, there is no unique one-to-one correlation between brain size and individual achievement or intelligence. (The lack of an objective method of determining total cortical surface area, and thereby taking into account both brain size and structure—*i.e.*, a smaller brain may be more deeply fissured, etc.—leads one to expect that studies relating one variable such as brain weight to some standard of mental ability would produce correlation coefficients of a low, positive order of magnitude; and, in fact, this has been the result of such psychological studies) (30). Nevertheless, studies of large numbers of brains have established a positive relationship—statistical in nature—between brain weight and mental capabilities (31), and as Professor Carleton Coon notes "among living populations, absolute brain size is generally, although not necessarily individually, related to achievement" (32). Furthermore, the brains of intellectually distinguished men are generally larger and more complex and those of mental defectives are generally smaller, with visible defects in the cells of the cerebral cortex (33).

2. The biological processes of race formation (differential selection of hereditary variations arising from mutations and genetic drift in reproductively isolated populations, with these differences then perpetuated and stabilized through continued isolation and inbreeding), which have brought about such vast physical differences

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amongst the various races of mankind, have also produced hereditary racial differences in psychological and physiological characteristics. Since the brain is a product of evolutionary development, one should also expect to find significant racial differences in the size, shape and structure of the brain.

3. A race may be defined as a group of people who are characterized by a diagnostic combination of hereditary morphological (anatomical), physiological, and psychical traits, which have been derived from their common descent and are limited in their range of variation (34). It must here be emphasized that since the concept of race is "organic" in nature, no single trait is diagnostic of a particular race but rather the combination of a constellation of characteristics. Comparisons between racial groups with respect to a single trait—whether physical, physiological, or psychical—can therefore be expected to take the form of overlapping statistical distributions. The significance of the differences noted can in turn be determined by the usual statistical tests (35).

4. The most outstanding physical attribute of Man is the great size of his brain (36). It is generally believed that natural selection has brought about the evolutionary trend toward increased brain size, because "brain power confers enormous adaptive advantages on its possessors" (37). Consequently, virtually all anthropologists use measures of cranial capacity and brain weight to evaluate the evolutionary status of fossil men and to determine their relation to living races (38). This is done in the belief that the nearer the brains of fossil men approach those of modern man "in volume and in convolutionary pattern, the nearer the owners were to us in feeling, thinking, and doing" (39). There is certainly a rough correlation between brain size in fossil races and degree of technological development. (Although Neanderthal Man was characterized by a relatively large cranial capacity, evidence from cranial casts indicates a simplicity in brain structure) (40).

5. Recent evidence indicates that as a result of the severe selective pressures of the last Glacial Epoch (Upper Pleistocene Period) the accelerated pace of evolution among the Caucasoids and Mongoloids of the Paleartic regions produced in these peoples a cranial capacity and brain weight significantly larger than that of the Negroid and other primitive peoples of the tropical and sub-tropical regions of the world (41). Certainly no less an authority than Sir Arthur Keith, in discussing the brains of the Upper Palaeolithic proto-Europeans, could write that they were "not only voluminous, but also rich in convolutions and well-developed in those 'higher' regions which are regarded as serving as 'association centres.' There was no lack of brains amongst

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the ancient mammoth-hunters of Moravia. Their culture reveals a prolific artistic ability" (42).

6. In addition to the high level of artistic ability displayed in the cave-paintings of the Upper Palaeolithic proto-Europeans (43), it should also be noted that the development of agriculture and animal husbandry (the vital prerequisites for establishing complex, urban societies) was initiated about 8000 years ago in the Near East by light-skinned Caucasoids, who in turn diffused these techniques to other racial groups (44). Furthermore, it is also true that up to the present time, complex, urban, and literate civilizations have been created only by the larger-brained and thinner-skulled peoples of Caucasoid and Mongoloid racial origins (45). (This statement remains valid even though some relatively primitive Mongoloid groups (Eskimos, Buriats, Kalmucks, etc.) may also be characterized by larger brains) (46).

7. BRAIN SIZE: Despite sampling difficulties and variations in methods, enough comparative racial studies of brain weight have been completed to warrant a quantitative description of the racial differences. The average cranial capacity of European Whites is from 100 to 175 cc. greater than that of African Negroes, and their average brain weight is some 8 to 12% greater (47). (The range of variability is not the same in the two groups and the differences in size are statistically significant). Mongoloids fall between the Caucasoid and Negroid averages in cranial capacity and brain weight, while primitive peoples such as the Australian Aborigines and Bushmen-Hottentots are considerably below the Negroid average (48). (Professor Gates, for example, gives the following data on racial brain weights: "Comparative weights are given as 1380 grams for Caucasoids, 1300 grams for Mongoloids, 1280 grams for East Africans, 1240 grams for Negroes and 1180 grams for Australian Aborigines") (49). In making such quantitative comparisons, however, it is necessary to use *representative* samples of the brains of the various racial groups. Dr Todd's study, for example, compared the cranial capacity and brain weight of a sample of urban, middle-class Negroes in Ohio with a sample of derelict Whites drawn from the lowest social strata and found the cranial capacity of the Whites was 40 cc. (3%) larger than that of the Negroes. In his summary, Professor Todd carefully noted that the cranial capacity of the Negro group was similar to that found in other studies (such as Professor Karl Pearson's) and could be considered racially representative, while the cranial capacity of the White group was substantially lower than that found in European studies and should *not* be considered representative. Despite Dr Todd's qualifying statements,

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Ashley-Montagu cites his statistics as indicative of the numerical racial differences in brain size (*Man's Most Dangerous Myth: The Fallacy of Race*, p. 222). It should also be noted that the comparison of samples equated for socio-economic and/or cultural status would not necessarily be representative of the parent racial population, since, to the extent that race correlates with social status, the samples may represent significantly different areas of the distribution curve of cerebral characteristics of each racial population. In any event it is apparent that currently available scientific evidence substantially supports Professor Connolly's contention that "brain weight is a racial character" (50).

8. BRAIN SHAPE: As in the case of cranial capacity and brain weight, races also differ in brain shape (51). (These differences are again statistical in nature and take the form of overlapping frequency distributions). For example, compared to the brains of European Whites, the brains of African Negroes are relatively longer and narrower (52). The brain height of the Negro is also significantly lower than that of the Causasian, which leads Dr Vint to conclude: "The reduction in size of the native brain, as compared with the European, seems to be accounted for mainly by a failure in the development of height" (53). According to Professor Connolly, the frontal and occipital regions were relatively larger in the White brains, while the parietal region was relatively larger in the Negro brains (54). Dr J. C. Carothers interprets Connolly's findings on racial differences in brain shape as indicating that "many of the peculiarities of African psychology and psychiatry could be seen (in terms of physiology) as frontal idleness" (55).

9. BRAIN STRUCTURE: In addition to significant racial differences in brain size and shape, recent investigations have demonstrated statistically significant differences in the fissural pattern as well as in other morphological features of the brains of the major race stocks (*i.e.*, Caucasoid, Mongoloid, Negroid, and Australoid) (56). Professor C. J. Connolly (1950), in his comparative study of White and Negro brains, found differences in "the relative frequency in which certain sulcal combinations occur, and even the frequency with which the form of a sulcus appears, such as the lunate" (57). Dr F. W. Vint (1934), in his comparison of the brains of European Whites and East African Negroes, found significant differences in the thickness of the frontal cortex—the granular and supragranular layers being thicker in Europeans and the infragranular layer in East Africans. There was also a significant simplicity in the convolutional pattern of the brains of the African Negroes, whose cortex as a whole was thinner

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than that of the European Whites. Furthermore, Dr Vint found racial differences in the cyto-architecture of the frontal cortex—a paucity of large pyramidal neurons and an excess of small primitive cells in the brains of the East African Negroes (58).

10. ELECTROPHYSIOLOGY: Although electroencephalography is a relatively new science, recent investigations have established statistically significant racial differences in the brain wave patterns of European Whites and African Negroes (59). For example, the African Negro group showed a higher incidence of theta waves and a wider diffusion of the alpha rhythm over the cortical surface.

11. FUTURE RESEARCH: As Professor Carleton S. Coon has correctly noted, there is ample need for further comparative racial studies in brain anatomy and in brain chemistry, which still remains an unexplored area. However, it is the opinion of Dr Coon and other specialists in the field of race science that such studies will reveal "racial differences in specific functional areas, in metabolism, and in the degree of development of the association systems" (60), and thus provide not less, but *more* evidence of racio-psychological differences.

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(e) "The central problem of man's evolution is the rise of his brain in size and in complexity. We know the mental manifestations of modern man; we know the size and convolutionary pattern of his brain; we have reason to believe that these two aspects of his brain—the structural and psychological—are interdependent." Keith, Sir Arthur. 1930. *New Discoveries Relating to the Antiquity of Man.* New York: Norton, p. 468.

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The Scots in the United States

By NATHANIEL WEYL

Of the present United States population of about 180,000,000, approximately 60 million are of English and Welsh, approximately 19 million of Irish, and approximately 11.5 of Scottish origin.[1] The Scottish immigration consists primarily of old settlers; it was not driven by hunger, as were the Irish, and it has made distinguished contributions to the American élite in all areas which we have examined.

It is sometimes assumed that this immigration was positively selected in the sense that those who left Scotland for America were, on the average, more gifted than those who stayed at home. An examination of the pertinent name-frequency statistics suggests that this hypothesis is wide of the mark and that the Scottish stay-at-homes were much more impressive leadership material than those who emigrated to the United States.

We have reached this conclusion by computing weighted average performance coefficients in *Who's Who in America* 1955-57 for the 15 preponderantly Scottish names most common on 1956 U.S. Social Security rolls (BOASI) and on the Scottish Register of Births, Marriages and Deaths for 1936-40. This comparison reveals the astonishing fact that the average performance coefficient of the descendants of the emigrant Scots is 135 as against an average of 167 for those who stayed at home.[2]

Accordingly, Scots are an outstanding component of the American élite despite the fact that the emigrants come from stock which, on the whole, is considerably less gifted than the Scottish population of Scotland.

[1] These are merely forward projections of the detailed estimates made by U.S. Government immigration experts of the 1920 population of the U.S. by national stock. The 1920 table is reprinted in *The Immigration and Naturalization Systems of the United States*, U. S. Senate, Committee on the Judiciary, 31st Cong., 2nd Sess., Report No. 1515, 1950, p. 886.

[2] The BOASI names in order of frequency (using the Social Security six-letter coding system) are: CAMPBEll, STEWARt, ROSS, WALLACe, HAMILTon, MURRAY, ALEXANder, CRAWFOrd, GORDON, FERGUSon, CUNNINgham, MONTGOmery, DOUGLAs, DAVIDSon, McMILLan. The Scottish Register list is: MacDonald, Campbell, Stewart, Murray, Mackenzie, Mackay, Ross, McLean, Fraser, MacLeod, Ferguson, Davidson, Hamilton, Cameron and Macmillan. Rather than submit the detailed tables as part of this article, I have sent them to the Editor so that they will be available to anyone with a specialized interest in the matter.

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Regional Differences in Achievement

Sixty-five preponderantly Scottish names with an aggregate representation on U.S. Social Security rolls of 2·3 million were examined to determine whether or not significant regional differences in performance coefficients exist. All of these names are analyzed in Guppy's 1890 study of the homes of English family names and almost all are primarily Scottish in the opinion of Smith.[3]

TABLE I

Regional Differences in the Performance Coefficients of American Bearers of Scottish Surnames in WHO'S WHO IN AMERICA 1955-57 (*Performance Coefficient of* SMITH *equals* 94).

	NO. OF NAMES	BOASI FREQ. (thsds)	WWA FREQ.	P.C.S
1. Names widely distributed throughout Scotland	13	601	350	137
2. Border Counties	3	82	63	182
3. Lowlands[1]	21	578	329	135
4. Mid-Scotland[2]	13	528	294	133
5. Highlands[3]	15	556	326	139
TOTALS AND AVERAGE	65	2,345	1,362	137

[1] Below the Firth of Forth and the Clyde.

[2] Including the shires of Fife, Forfar, Perth, Stirling, Argyll and Dumbarton.

[3] North of the shires of Forfar, Perth and Argyll.

The data in this table suggest that no statistically significant differences in the abilities of the populations of the various regions of Scotland exist as measured by P.C.'s in *Who's Who in America*. The apparent exception to this conclusion (the Border Counties) is based on a small sample and may be due to random chance.

Class Differences in Achievement

In a previous article,[4] I showed that the bearers of English surnames of clerical and scholarly origin are markedly superior

[3] Elsdon C. Smith, *Dictionary of American Family Names*, Harper & Brothers, New York, 1956. In a very few cases, I have not accepted Smith's judgment on this matter, but have preferred my own.

[4] "Ethnic and National Characteristics of the U.S. Elite," THE MANKIND QUARTERLY, Vol. I, No. 4, April 1961, pp. 242-7.

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to the bearers of English names in general in all rosters of eminence studied. This difference occurs despite the fact that surnames were assumed in England approximately $6\frac{1}{2}$ centuries ago. The explanation offered for this consistent superiority in creative abilities, intelligence, scholarship, executive ability and professional leadership was selective mating, a process which presumably occurred without diminution during those centuries when such surnames as CLARK(E) connoted no difference in social status from the generality of Anglo-Saxon names.

In this article, I shall examine the performance coefficients of bearers of Scottish names in the U.S. to see whether or not significant differences in achievement are associated with the original class origin of the surnames. The Scottish names used are drawn from those which comprise the previous Table.

TABLE II

Class Differences in the Performance Coefficients of American Bearers of Scottish Surnames in WHO'S WHO IN AMERICA 1955-57. *(Performance Coefficients standardized so that the P.C. for* SMITH *equals* 94).

	NO. OF NAMES	BOASI FREQ. (thsds)	WWA FREQ.	P.C.S
1. Names of Royal Origin or Association	7	359	257	169
2. Anglo-Norman Names	6	271	166	145
3. Other Place Names	24	721	413	133
4. Christian Names	7	296	166	133
5. "Macs" and "Mcs"	13	302	145	114

[1] The names of Royal Origin are: BRUCE, CUMMINgs, DOUGLAs, GUNN, MACDONald, STEWARt and STUART. The Anglo-Norman names are: BOSWELl, CRAWFOrd, CUNNINgham, GORDON, LINDSAy and SINCLAir. The place names are: FRASER, RAMSEY, BARR, BLAIR, BUCHANan, CARMIChael, DUNLAP, FORSYTh, FULTON, LIVINGstone, LOGAN, POLK, POLLOCk, WADDELl, GALLOWay, GUTHRIe, STERLIng, WALLACe, FORBES, LESLIE, MONROE, MURRAY, ROSS and SUTHERland. The Christian names are: ALEXANder, BEATTY, DAVIDSon, DONALDson, FERGUSon, MATHISon and RITCHIe. Finally, the names beginning with Mc or Mac are: McCULLoch, McFARLand, McINTOsh, McINTYre, McLEAN, McMILLan, McNEILl, MacINT(osh or yre), McKAY, MACKEY, McKENZie, McLEOD and McPHERson.

The class differences, as contrasted with the regional ones, are marked and appear to be closely associated with original social status. The bearers of royal names exceed the descendants of the Anglo-Norman aristocracy by 24 points on the average; the latter

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average 12 points higher than the names borne by the majority of the people (non-aristocratic place names and modifications of Christian names). The Celtic names, excluding the royal MacDonald and as represented by the prefixes MAC and MC, are, on the average, 19 points below the third and fourth groups. Writers on surname origins have advanced the theory that the least skilled groups in the population, and specifically the vast mass of the peasantry, were usually named in accordance with their patronymics or distinguishing characteristics, whereas the more highly skilled minority took names from its occupations and crafts. If significant differences in ability existed, they have, in the case of Scottish Americans at least, been obliterated by time.

While the average P.C.'s of these class categories reveal large and significant differences, there is little homogeneity within them. This does not invalidate our findings, but rather points to the probable presence of various other causal processes in the situation. The degree of intra-batch diversity can be shown by a few examples. Among Royal Names, STUART ranks highest with a P.C. of 450; GUNN and STEWARt lowest with P.C.'s of 123. In the Anglo-Norman artistocratic group, the high name is LINDSAy (218); the low name is CUNNINgham (116). In the name group with MC or MAC prefixes, McLEAN is high (218), whereas MACKEY is lowest (59).

The clerical names of Scotland do not follow the English pattern. McPherson (son of the parson) has a performance coefficient of only 95—astonishing when one considers the traditional Scottish pre-occupation with theology and the intellectual and community leadership exercised by the clergy.[5]* On the other hand, Buchanan, meaning seat of the Canon, has a P.C. of 166 and McLean (son of the servant of St John) has a P.C. of 218.

In conclusion, three findings seem important. (1) The Scottish immigration to the United States was much less gifted (in terms of *Who's Who in America* performance coefficients) than the Scots who stayed at home. (2) No statistically significant differences in achievement were found between the different regions of Scotland. (3) There is a marked positive association between the class origin of groups of surnames and their performance coefficients.

[5] The explanation may be simply that the Scottish clergy at large was not intellectually distinguished at the time surnames were adopted.

* The probable explanation here is that the early Celtic clergy were appointed on a tribal basis and their offices were hereditary. Consequently, the aptitude for scholarship was, in many instances, a much less important factor than to whom they were related.—EDITOR.

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The Provenance of Scientists *

By NATHANIEL WEYL

The subject of this article is the shifting geography and ethnology of scientific genius from the Middle Ages to the present. For the first fourteen centuries of the Christian era, the outstanding source is the three volumes of his monumental *An Introduction to the History of Science* which Professor George Sarton of Harvard managed to complete before his untimely death. The geography of scientific achievement in specific disciplines has been explored by Professor Harvey C. Lehman. In addition, I have made various calculations of my own.

By 1100 A.D., world scientific leadership had passed decisively from Islam to Christendom. Of the 1404 scientists listed by Sarton for 1100 to 1400 A.D., 97, or 56·8%, were Christians. In the 12th century, France produced more outstanding minds than any other European country, but in the 13th century leadership passed to Italy and by the 14th century Italian genius was twice as plentiful as French. The British Isles ranked third, followed after a substantial lag by Germany, Christian Spain and the Lowlands. During this period the Oriental civilizations in aggregate produced about as many eminent scientists and scholars as the Jews. China accounted for half of them and ranked with the British Isles.

When we attempt to equate the distribution of intellectual eminence in Europe during 1100-1400 A.D. with population, we run into a major difficulty. The first even tolerably reliable estimates of European population by countries are those of Beloch for 1600 and Riccioli for 1661. Assuming that no significant changes in the *relative* distribution of European population occurred between the medieval and the post-Renaissance periods, we can arrive at a rough index of national scientific productivity by using Sarton's figures for scientists and Beloch's for population.

* Taken in part from a forthcoming book, *The Geography of Intellect*, by Nathaniel Weyl and Stefan T. Possony.

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TABLE I

Scientists, Scholars and Philosophers listed by Religion and Nationality (source: Sarton, *op. cit.*)

COUNTRY OR RELIGION	TOTAL ENTRIES 1100-1400 A.D.	PERCENTAGE OF TOTAL
Western Christendom		
Italy	232	16.5
France	161	11.5
British Isles	111	7.9
Germany	65	4.6
Christian Spain	43	3.1
Lowlands	37	2.6
Other	62	4.4
Total Western Christendom	711	50.6
Total Eastern Christendom	86	6.1
Total Christendom	797	56.7
Islam	280	20.0
Israel	162	11.5
All Other	165	11.8
TOTAL	1,404	100.0

TABLE II

Estimates of the Productivity of European Countries in Science during 1100-1400 A.D.

REGION OR COUNTRY	SCIENTISTS (Sarton)	POPULATION (Beloch)	INDEX OF PRODUCTIVITY
British Isles	111	5.5	138
Italy	232	13	122
All Spain	135	10	92
Netherlands	37	3	84
France	161	16	69
TOTALS	676	47.5	100

Italy was by all odds the most important intellectual center. If we add her Muslim and Jewish to her Christian men of intellectual eminence, Spain rises from insignificance to third place in Europe and the total of Spanish thinkers jumps from 43 to 135.

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The geography of genius in medieval Europe was characterized by concentration in the western part of the Continent and somewhat greater fecundity in the South than in the North. This latter conclusion does not contradict the climatic theories of Ellsworth Huntington and others as the climate of Western Europe was unusually cold, stormy and bracing between 1150 and 1400 A.D.

When we consider intellectual contributions *in relation to population and urbanization*, the British Isles assumes a leading position. At the time of the Black Death (1345-1349), the estimated population of France was 20 million, that of England probably not over 5 million. Yet the British Isles produced 70% as many outstanding minds as France between 1100 and 1400 and produced 88% as many during the 14th century. This is remarkable when one remembers that urbanization was far more advanced in the South than in the North and in France than in England.[1]

Sarton's history also sheds light on the quantitative contribution made by Jewry to science in various periods. The percentage of all listed scientists who were Jews was 6·1% for the first four centuries of the Christian era, 2·6% for the Dark Ages (400 to 700), 9·1% for the era of Islamic cultural leadership (700 to 1100), 11·4% for the 12th century, 15·0% for the 13th century and 10·9% for the 14th. For the entire period of 1400 years, Sarton lists 201½ Jewish scholars and scientists in a global total of 1897. This works out to 10·6%.

The Jewish share in scientific achievement during the first four centuries of our era is about what one would expect statistically in view of the fact that at the time of Christ about one out of every ten subjects of the Roman Empire was a Jew.

The situation during the Middle Ages, however, does not conform to statistical expectation. About 11% of the outstanding minds of the period 1100 to 1400 were Jews. Yet the Jewish population of the world has been estimated at two million in 1200 by a modern authority; the population of Europe at that time was about 61 millions and that of the world perhaps 348 millions. Thus, Jewry comprised 3·3% of the population of Europe and 0·6% of the population of the world; yet she furnished 11% of the world's best scientists and scholars.

Commenting on the 14th century, Sarton finds it remarkable that there should be more Jewish than Muslim scientists, since

[1] In A.D. 1300, Paris had an estimated 150,000 inhabitants; in A.D. 1200, London had merely 20,000. These estimates are culled from Henri Pirenne, *Medieval Cities*, Doubleday Anchor, New York, 1956, and from Will Durant, *The Age of Faith*, Simon and Schuster, New York, 1950. They should be taken with a grain of salt as medieval conceptions of large numbers were hazy in the extreme.

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"western Jews were now restricted to Southern France, Spain and Italy," where they were subjected to multiple "limitations, humiliations and vexations." Moreover, Sarton's work understates the Jewish contribution since his data for the 14th century exclude Jews who wrote in Arabic.

Eugenic mate selection and reproduction for intelligence became the rule among the Jews at about the time of the Diaspora—that is within a century of the death of Christ. By the late Middle Ages, these processes had been at work, with many remissions and exceptions, for over a thousand years. Fertility was the duty of the rabbi and scholar; celibacy that of the priest. The impressive Jewish role in medieval science, despite the restrictions imposed by a hostile society, illustrates the power of eugenics fundamentally to alter the human potential.

Science After the Reformation

In a 1947 article, Harvey C. Lehman made interesting comparisons of national differences in scientific creativity over roughly the last 300 years. His method was to take all names listed in authoritative histories or encyclopaedias of the sciences and then to tabulate them by national origin. To minimize nationalist or ethnocentric bias, he excluded contemporary figures. All his tabulations stop at various dates between 1911 and 1939. These tables show a general German pre-eminence in the sciences, with France, England and the United States normally following in that order. They do not reflect the havoc wreaked upon the European mind by Nazism and World War II nor do they show the contemporary world supremacy of the United States in science.

Lehman found that Germany led the world in chemistry, pathology and medicine; France in mathematics, and the United States in genetics and entomology.

The six compilations of scientific achievement listed by Lehman center at approximately the year 1865. To arrive at an approximate index of national scientific creativity we have added the total listings for each country and compared them with its estimated 1865 population. While this procedure arbitrarily weights the sciences by the number of listings in the textbooks chosen by Lehman, a different weighting system would probably not have materially changed the results.[2]

Of the 5358 scientists whose national origin is known, the English-speaking countries provided 35·3% and Europe north of

[2] Readers can judge this for themselves. The total listings are: chemistry 1,707, genetics 249, entomology 828, mathematics 1,442, pathology 388 and medicine 1,405.

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the Dolomites and west of the Vistula 56·7%. Of the remaining 8%, southern Europe accounted for 4·8%, eastern Europe and the U.S.S.R. for 2·7% and all other areas for ·5%. The geographical pattern of scientific creativity disclosed is one reaffirmed by other objective analyses of the geography of intellect.[3]

(1) The locus of high intellectual attainment is Northern and Western Europe, the British Isles and the areas of British overseas settlement. The gradient of mental achievement drops sharply as one moves east or south of this concentration zone.

(2) Protestant countries are generally more productive than Catholic ones; Teutons and Celts tend to excel Latins and Slavs.[4]

(3) Those countries which receive refugees surpass those that expel them.

The countries producing more than 30 eminent scientists per million inhabitants in this order: Switzerland (81.9), Scotland (52.8), England and Wales (40.9), Holland (36.6), Germany (36.0) and Denmark (32.0). These nations have certain characteristics in common. (1) They are preponderantly Protestant and hence have escaped the dysgenic consequences of clerical celibacy during the four centuries since the Reformation. (2) They are subject to cold, bracing climates, more so than the European average. (3) They are to a large extent Nordic in racial heritage. (4) For the most part, they are countries which have received political and religious refugees as against expelling or exterminating them.[5]

Switzerland owes her pre-eminent position to the fact that she was a haven for victims of the religious wars. She thus attracted a minority of exceptional intelligence and outstanding strength of character and moral purpose. Similarly, Holland benefited from the expulsion of the Jews from Spain and the British Isles from the persecution of the Huguenots. With the exception of the Thirty Years War in Germany, these countries were comparatively immune from civil strife in which large sections of the intellectual élite were exterminated and from foreign wars in which élite elements of the youth met death in battle.

If we compare the primarily Protestant with the preponderantly Catholic countries, we note that 121 million inhabitants of the former accounted for 3844 eminent scientists whereas 129 million

[3] Including my own articles on name-frequency analysis of élite groups published in prior issues of THE MANKIND QUARTERLY.

[4] Jewish productivity is not revealed by the Lehman figures since there is no breakdown between Jews and non-Jews.

[5] It should be remembered that Lehman's tabulations all terminate before 1940. Hence, the dysgenic effects of Nazi extermination of the Jews are not disclosed.

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of the latter produced only 1348 great scientists. The rate per million inhabitants is 31.8 for the Protestant nations as against 10.4 for the Catholic ones. The Scottish rate of 52.8 is almost four

TABLE III

Provenance of Outstanding Scientists and Production of Scientists per Million Inhabitants. (Data from Lehman, *op. cit.*).

RANK	COUNTRY	EMINENT SCIENTISTS	POPULATION IN 1865 (millions)	SCIENTISTS PER MILLION
2.	Scotland	169	3.2	52.8
3.	England & Wales	868	21.2	40.9
9.	United States	768	35.6	21.5
11.	Ireland	77	5.6	13.8
	Subtotal	1,882	65.6	28.7
1.	Switzerland	213	2.6	81.9
4.	Holland	128	3.5	36.6
5.	Germany	1,441	40.0	36.0
6.	Denmark	55	1.7	32.4
7.	France	997	37.0	27.0
8.	Sweden	94	4.1	22.9
10.	Norway	26	1.7	15.3
13.	Belgium	31	4.8	6.5
14.	Finland	5	1.8	2.8
15.	Austria & Bohemia	52	19.7	2.6
	Subtotal	3,042	116.9	26.0
12.	Italy	239	34.0	7.0
17.	Portugal	7	4.5	1.6
18.	Spain	13	16.0	0.8
	Subtotal	259	54.5	4.8
16.	Russia & Poland	126	64.5	2.0
19.	Hungary	9	13.0	0.7
	Subtotal	135	77.5	1.7
	All Listed Countries	5,318	314.5	16.9
	All Others	40	(?)	(?)

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times that of Ireland (13.8). Holland produces 36.8 scientists per million inhabitants to Belgium's 6.5. Finally, we note that Spain, which ranked ahead of Holland and France in 1100 to 1400, produced only about 1/35th as many scientists *per capita* in the post-Reformation period as France. The most obvious causes of Spanish intellectual decline were clerical celibacy, the expulsion of the Jews and the destruction of heretics by the Inquisition.

Mathematical Genius

In his stimulating *Men of Mathematics*, the late Dr Eric Temple Bell gave a good deal of biographical data concerning the 34 men and one woman who were, in his opinion, the greatest mathematicians the world has known.[6] Here, we can see in microcosm the working out of the processes to which we have already alluded. The field of mathematics is peculiarly rewarding for this sort of study since it is one of the few areas in which a great reputation cannot be acquired by industrious or politically astute mediocrities.

Of these 35 mathematical geniuses, three were ancient Greeks. Of the remaining 32, no less than 12, more than a third, were Frenchmen. Germany accounted for 8, England for 4, Russia and Switzerland for 3 apiece, Norway and Ireland[7] for one each. Here, as in the larger tabulation, Swiss pre-eminence in the production of genius per million inhabitants is self-evident.

Five of the 32 non-Greek mathematical geniuses (Kantor, Jacobi, Sylvester, Kronacker and Dedekind) were Jews and a sixth, Lobatchewsky, is believed to have been the son of converted Jewish parents. The Jewish total can be considered to be $5\frac{1}{2}$, or 17% of the non-Greek mathematicians.

The negative influence of clerical celibacy and religious persecution on the production of genius is indicated by a study of these mathematicians. Of the 13 known or believed to have been born into the Protestant faith, three (Abel, Euler and Riemann) were the sons of ministers. Religious persecution drove the Bernouillis from Antwerp in 1583, where a massacre comparable to St Bartholomew's Eve was impending. They took refuge in Switzerland where they produced eight remarkable mathematicians and over 60 descendants of distinction or eminence.

If these 13 outstanding Protestant mathematicians had been of Spanish stock, only eight would presumably have been born and

[6] Dover Publications, New York, 1937. Actually, Bell devotes a chapter to the Bernouilli family, which produced eight important mathematicians in three generations. We have assumed that only two of them, Johannes and Daniel, can be included among the greatest of all time.

[7] William Rowan Hamilton, whose father had emigrated from Scotland in his youth.

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survived. The three who were sons of clergymen would, in theory at least, not have been conceived; the two Bernouillis would have been put to death for heresy.

De Candolle made a study of the dysgenic effects of sacerdotal celibacy in which he found that, of the 101 scientists who were foreign members of the Academy of Sciences in Paris, 14% were the sons of pastors. Similarly, a large proportion of eminent Jews were the sons of rabbis. An analysis of influential men in English history revealed that 1270 were sons of ministers, 510 sons of lawyers and 350 sons of physicians. One in every six of the foreign members of the English Academy of Sciences was a parson's son. Visher in a study of *Who's Who in America* for 1922-23 found that "clergymen fathered 2400 times as many notables as did unskilled laborers in proportion to numbers."

Nobel Prize Winners in Science

An immensely rewarding field of inquiry is the racial, regional and national provenance of Nobel Prize winners in science. With brief hiatuses, these prizes have been awarded continuously for 60 years. They have been bestowed on a merit basis, without regard to nationality and race, and are the most important international distinction a scientist can attain.[8]

Between 1901 and 1960 inclusive, 214 Nobel Prizes were granted for Physics, Chemistry, and Medicine and Physiology. Of these 103 were awarded during 1901-33 and 111 in 1934-60. Since Hitler came to power in 1933, that year marks a convenient demarcation point in any analysis of the shifting geography of scientific genius.

The most significant change that occurred during this era was a dramatic, and perhaps permanent, shift of scientific leadership from the Continent to the United States. The areas occupied by the Nazis and subjected to their policies of terror and genocide lost a large portion of their scientific élites. Consequently, the Continent ceased to produce Nobel scientists in numbers comparable to the pre-Hitler period.

Thus, in 1901-33, Germany and Austria were the birthplaces of 38 of the 103 Nobel scientists. All but 26 of these 103 men had been born on the European Continent and all but 31 lived there.

By contrast, in 1934-60 only 49 of the 111 Nobel scientists were born on the Continent. Only 20 were born in Germany and Austria and only 11 lived there when they won their awards. France produced only two Nobel scientists in 1934-60 as against 12 in 1901-33.

[8] This cannot be said of Nobel Prizes for Literature, which are at times bestowed upon mediocrities, and certainly not of the Nobel Peace Prizes.

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In the first period, one-fourth of the prize winners were born in English-speaking countries; in the second period, over half. In 1934-60, almost three-fourths of the Nobel scientists lived in the United States, Britain or the Dominions.

During the entire 60-year period, creative work in science has been concentrated in a small area and among a small minority of mankind. Eastern Europe and the U.S.S.R. provided only 17 of 214 Nobel scientists. Southern Europe furnished only 7. Only 5 were born in the so-called underdeveloped areas (two in China and one each in Argentina, India and Japan). Neither the Muslim world nor Negro Africa has ever produced a scientist of Nobel stature.

TABLE IV

Nobel Scientists by Countries of Birth in Relation to Population.

RANK	COUNTRY	NO. OF NOBEL SCIENTISTS	POPULATION IN 1938 (mils.)	SCIENTISTS PER 10,000
1.	Switzerland	7	4	175
2.	Sweden	8	6	133
3.	Netherlands	10	9	111
4.	Denmark	4	4	100
5.	Germany-Austria	58	76	76
6.	United Kingdom	32	48	68
7.	Belgium-Luxembourg	3	9	33
8.	United States	43	131	33
9.	France	13	42	31
10.	Other English-speaking[1]	6	22	27
11.	Finland	1	4	25
12.	Poland, Hungary & Czechoslovakia	9	59	15
13.	Italy	13	42	9
14.	Spain-Portugal	3	33	9
15.	Yugoslavia	1	14	7
16.	U.S.S.R.	7	170	5

[1] Excludes Negroes and colored in the Union of South Africa.

The outstanding role of both refugees and Jews as Nobel scientists becomes obvious when one examines the roster of names. The number of Jewish award recipients was estimated after consulting various specialized studies and a who's who of American Jewry. Consideration was given to the names of the subjects and of their parents and to such biographical data as emigration from Nazi-controlled territory in the 1930's.

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Of the 214 prize winners during 1901-60, 27 were entirely Jewish and 9 were half or partially Jewish. Despite the extermination of European Jewry, the Jewish share in Nobel science rose from 13% of the total in 1901-33 to 16% in 1934-60. Over the entire period, the Jews accounted for 7% of the awards in chemistry, 15% in physics and 20% in medicine and physiology, the percentage for all disciplines combined being 15%.

Of the 31½ Jewish Nobel scientists, 18½ were born in Germany-Austria, 5½ in Eastern Europe and Russia and 4 in the United States. No less than 18½ emigrated from the lands of their birth, 13 coming to the United States.

Of the 58 Nobel scientists born in Germany-Austria during the entire period, 18½ were Jewish. Thus Jews constituted 2% of the population of Germany-Austria, but furnished 32% of its top scientists.

While Jewry made a disproportionately large contribution to German science, its persecution was not the sole cause of Germany's scientific decline. In 1901-33, 27 non-Jewish German-Austrians won Nobel science awards, while in 1934-60 only 13 did so. This drop of over 50% can be attributed to such factors as the distortion of German science by Nazi ideology, malformation of scientific effort in the war and immediate postwar periods, emigration of German scientists, persecution of non-Jewish German intellectuals and the weakening of intellectual stimuli as laboratories and universities were dejudaized.

The record of Nobel scientists reflects an historical process, the nature and importance of which are frequently overlooked. This I shall call dysgenic deterioration, when it is gradual, and dysgenic catastrophe, when it is overwhelming. It consists of the nullification or extermination of intellectual élites. Under the Nazis, the process was one of annihilation of the intellectuals in part and the Jews *in toto*. Under Communism, the war against intelligence assumes the form of persecution and physical destruction of the upper classes and the intelligentsia. In advanced countries, these leveling processes are probably survival necessities for totalitarian dictatorships, since the creative minorities invariably threaten their power.

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BIOSOCIAL INFLUENCES ON THE HUMAN SEX RATIO

By ROBERT E. KUTTNER

The evolutionary and genetic aspects of sex ratio regulation have received considerable attention in recent studies.[1] That social factors also influence the sex ratio is well recognized.[2] Few attempts have been made, however, to explore the possible relationships that social influences may have to evolutionary mechanisms. It would seem clear in advance that a species which could respond to varying environmental circumstances by an appropriate variation of the sex ratio would have a valuable evolutionary advantage.

The data reviewed by Crew[2] demonstrate that the male fetus and neonate are more susceptible to trauma than the female. More recently, Stott[3] presented evidence that maternal psychosomatic ailments tend selectively to damage male children. Stott[4] suggests that the production by stressed mothers of male infants with poor resistance serves an evolutionary end. The wastage of males during periods of scarcity or war is economical to a primitive society in that depleted resources can then be better devoted to the rearing of females. It is the future availability of females which governs population size.

On the other hand, it is commonly observed that an abundance of male births follow shortly after a return to peaceful and normal conditions.[2] Confirmatory reports are cited by Bernstein[5] who also offers a theoretical explanation. Conditions that dislocate a society may force a separation of mates. In a primitive community facing a crisis, males may be repeatedly absent from their families for long intervals on military expeditions, distant hunting trips, and pre-migratory explorations. Bernstein's data indicate that highly fertile couples conceive a relatively greater percentage of males than less

[1] Shaw, R. F. and Mohler, J. D., *Amer. Nat. 87*, 337 (1953); Kolman, W. A., *Amer. Nat. 94*, 373 (1960); Edwards, A. W. F., *Nature 188*, 960 (1960).

[2] Crew, F. A. E., *Amer. Nat. 71*, 529 (1937).

[3] Stott, D. H., *Lancet*, 1006 (1957).

[4] Stott, D. H., *J. Psychosom. Res. 3*, 42 (1958).

[5] Bernstein, M. E., *Amer. J. Hum. Genet. 10*, 68 (1958).

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fecund pairs. When opportunities for conception are limited for the above reasons, a greater proportion of births would occur to highly fertile parents, and this would shift the sex ratio more in favor of the male. This male rebound subsides after the less fecund couples again contribute their share to the birth statistics, and the sex ratio returns to the pre-crisis level when social equilibrium is fully restored.

If this interpretation is correct, the surplus of male births immediately following periods of hardship would be explained. The high male producing families studied by Bernstein yielded 10 per cent more males than lower fertility couples. The reproductive performance of such families during periods of strife or other emergency would be an evolutionary asset to a society suffering a depletion of males at all age levels. Under modern conditions sex ratio changes would not be of the same magnitude. Civilian populations today are largely insulated from the direct stresses and hazards of war. Reserve food is stockpiled, pregnant women receive special rations, and morale is so carefully controlled that pathogenic tensions may actually decline.[6] Other factors like "baby booms" may also confuse analysis.

For primitive societies, however, it seems valid to hypothesize a reproductive "homeostasis" mechanism that adjusts sex ratio imbalances induced by environmental or biosocial factors. This regulation is postulated to involve the synchronization of two separate processes, namely, the selective mortality of fetal or newborn males under conditions of stress, and the restorative tendency of increased male conceptions which occurs at the same time, and which persists until the season of stress ends. The results of this last process can be detected only after the male attrition is suspended and the surplus males are safely delivered and reared. Of interest is the fact that the greater genetic vulnerability of the male is exploited as a positive element for group survival, and that genetic lines able to conceive a disproportionate number of males are preserved from other selective forces that may tend to equalize the sex yield.[7]

Future research on the human sex ratio would profit from the cooperation of anthropologists. Isolated racial or tribal groups may still exist that have not yet achieved a stabilized sex ratio. There is evidence that one of the Norse colonies on Greenland became extinct because of a deficit of male births.[8] Strains of mice

[6] Odegard, O., *Acta Psychiat. Neurol. Scand. 29*, 333 (1954).

[7] Shaw, R. F. and Mohler, J. D., *Amer. Nat. 87*, 337 (1953); Edwards, A W. F., *Nature 188*, 960 (1960).

[8] Gini, C., *Inst. Econom.* (Bergen), Paper No. 10 (1958).

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have been bred that show altered sex ratios.[9] Presumably comparable human "strains" also exist. The recent finding that the frequency of twin births differs between Negro and white suggests that important discoveries remain to be made in the area of birth statistics.[10]

[9] Weir, J. A., *J. Hered. 44*, 133 (1953); Wolfe, H. G., *Genetics 46*, 55 (1961).

[10] Lilienfield, A. M. and Pasamanick, B., *Amer. J. Hum. Genet. 7*, 204 (1955).

Extra Dentition in the West African Negro

By J. P. WATTERS

I joined the Fifth West African (Gold Coast) Field Ambulance in mid 1941. My duties included the dental inspection of a wide variety of West African Negroes.

My attention was attracted to a great number of cases exhibiting teeth extra to the normal complement. As a student I was taught that such anomalies are very rare.

I do not know if accurate statistics exist for Europeans exhibiting fewer or more teeth than the normal thirty-two. I can say from my own experience that I cannot recall seeing a properly formed extra tooth in a European in twenty-two years of practice. In fact the opposite has been my experience, as a surprisingly high proportion of my patients have been congenitally short of teeth.

In Durban, South Africa, from 1939 to 1940 and from 1946 to 1958 I frequently found this, as I had a large children's practice. Since coming to Pitlochry, Scotland, in June 1958 I have noticed this abnormality to be even more common. At first I thought this might be a pocket of Perthshire where inbreeding had increased the average, but I have found that quite a number are of English parents and others are from outside Perthshire.

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Amongst Europeans the teeth I have found missing most commonly are the lower second pre-molars, upper lateral incisors and third molars in that order. Recently for the first time I saw a case where all four upper and lower first pre-molars were congenitally absent.

In 1941 recruiting teams toured the villages all over West Africa. Because of malnutrition and endemic diseases—yaws, malaria, trypanonosomiasis and infestations, etc.—a very large number of males were rejected and eventually only about 2% of those originally medically examined were taken into the Army. Those accepted grew daily healthier and stronger under army conditions and diet, and in Burma later performed prodigious feats of strength and endurance. It will be seen therefore that I was seeing the cream of the man-power of the Guinea Coast.

After a few months I was impressed by the frequency with which I encountered extra teeth—usually an extra pre-molar, either upper or lower—sometimes only in one quadrant but frequently in all four. These pre-molars were perfectly formed and were placed between the other two pre-molars forming a triangle. Extra molars also were common, normal in shape and placed in a natural seeming position behind the third molar without any overcrowding.

I personally examined the teeth of the men of the Seventh Gold Coast Regiment, the Eighth Gold Coast Regiment and the Second and Third Gold Coast Regiment—approximately one thousand men per battalion. I also examined troops of all sorts of corps and units. By mid 1942 I had begun to note all cases where one or more extra teeth were presented, and I found that between 2½% and 3% of all Africans I saw had one or more extra teeth. The Eighth Gold Coast Regiment was the first thousand men I examined with the intention of noting numbers of men with missing teeth. This was in Kintampo in 1942. Their score was 3% almost exactly. Troops in the Eighth Gold Coast Regiment were recruited from Northern Territories, Ashanti and Togoland, with a sprinkling of Nigerians.

I took impressions and made models of a soldier with three pre-molars and four molars in each quadrant of his mouth. These models I gave to the Edinburgh Dental Hospital Museum. They were not on view when I enquired for them there two years ago, as I understand they had been re-organising the museum. If the skull of this man should be discovered one day by an anthropologist I imagine it would give rise to much speculation.

In my view this is an interesting phenomenon and would repay further research.

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PSYCHOLOGICAL TESTS OF THE KALAHARI BUSHMEN

By Dr HELMUT REUNING

TRANSLATED FROM THE GERMAN BY DONALD A. SWAN

The high artistic level of the rock paintings and the unique, colorful and lively mythology of the Bushmen stand in remarkable contrast to the extremely scant material culture of this nomadic, hunting people. While the primitive hunting and collecting culture indicates a lack of any "will-to-progress," the graphic talent and the joy in narration presume an awakened intelligence and a lively temperament in the Bushmen. What type of mind have men, whose mode of life shows such contrasting traits? The author reports here on the first psychological investigations of the Bushmen during the Kalahari Expedition of August and September 1958, organized by the Witwatersrand University in Johannesburg. This undertaking by ten scientists of different disciplines—anthropologists, physiologists, bacteriologisits, and psychologists—yielded an abundance of worthwhile observations and experimental data about the peculiarities of the Bushmen. Further expeditions to investigate the rapidly decreasing number of Bushmen, who belong to one of the oldest races of the earth and are important to the understanding of the history of man and culture, were planned to take place in 1959 and following years.

The contradiction between the primitiveness of the Bushman culture and the astonishing power of expression of their myths and rock paintings—or at least of the rock paintings of not many generations ago—raises a question of a pronounced psychological nature: is it the "impulse to freedom" of the nomadic and hunting existence that causes the Bushmen to reject every influence of foreign cultures in spite of various contacts with other peoples and causes them to withdraw into the most inhospitable regions of the African continent? Or is it a lack of certain mental capabilities that makes the adaptation to higher forms of culture impossible for the Bushmen? In regard to this question, I set myself the task of investigating how one could learn something at all about the mental development of the Bushmen living today, without depending on subjective impressions only. As far as that

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was possible, the capacity of the Bushmen in the region of conceptual and abstract thought was to be determined. His practical cleverness can scarcely be doubted. For this speaks, besides the testimony of other natives (one of their proverbs states: "The Bushman is the teacher"), the fact that he is capable of living under the hard conditions of existence of the Kalahari desert (Gusinde 1954).

THE TESTS AND THEIR EXECUTION

To our knowledge, no purely psychological investigations have yet been made on the Bushmen. We had, therefore, with the exception of the test series by Herskovits and others,[1] no models with reference to possible methods of testing. It was clear that only very simple, easily visible situations, which required no long linguistic directions could be considered. The use of paper and pencil appeared as much out of the question as the employment of complicated testing instructions and measuring instruments. The necessity of working in the open air, without a laboratory, further limited the selection. Just try to put yourself in the position of a Bushman, who is not only brought by white people into an "examination-like" situation, but moreover into a closed room, even if it is only a tent. After such reflections and some preliminary experiments with untrained black mine workers, a series of nine experimental tests was finally selected, from which four stood up well in relation to ease of application, degree of difficulty, and reliability of the results. These were:

(*a*) A Sand-Drawing Test devised for this investigation.

(*b*) A Colored Version of the Pattern-Completion Test, by H. Hector (1958, 1959).

(*c*) The Object-Relations Test by E. Zilian (1956).

(*d*) Ishihara's Charts for the testing of Color-Proficiency (*see footnote* 1).

[1] The other procedures were: (*e*) a series of geometric illusion-figures by Herskovits, Campbell and Segal (1956); (*f*) a variable model of the Müller-Lyer figure: <—>—<. (The Herskovits series and the Müller-Lyer figure, Tests (*e*) and (*f*), were employed by the author for another department of the National Institute for Personnel Research, and indeed on 46 "farm-Bushmen," that is to say those who had hired themselves out to farmers as herdsmen and the like were living on the gigantic farms of the northern Kalahari. P. Morgan reports the results of this special investigation in the *Journal of the National Institute for Personnel Research*, Vol. VIII, 1959); (*g*) a Classifying-Problem, similar to the Concentration-Progress Test by D. Abels (1954), in a form suitable for illiterates; (*h*) Recognition-Problems with illustrations of more or less great similarity (1951); (*i*) a Block-Construction Problem, taken from the "Adaptability

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The Sand-Drawing Test

Earlier tests of the drawing ability of the Bushmen living today are said to have turned out completely negative (Jensen 1946-47). We were not able to obtain the original reports on these tests. But it did not appear to us out of the question that unsuitable methods could have influenced the result of these drawing tests. In any event, we were not entirely convinced of the drawing inability of the Bushmen and we decided on a new test with drawings in the sand. A square black board (75 x 75 cm.) strewn with a thin layer of not too fine, bright sand is placed flat on the ground in front of the squatting or kneeling person being tested. Instructions are given through the interpreter to draw an animal or a man in the sand. If necessary, the test instructor shows how it is done by etching an easily recognizable object (for example, a tree) in the sand with his finger and then stroking the sand smooth again. With the help of a Leica camera placed above the drawing board in an appropriate manner each finished drawing is recorded. Persons being tested for whom it seemed too difficult to draw a man or an animal were permitted to reproduce any other simple object.

The Pattern-Completion Test

Two preliminary exercises and 11 problems of the first part with the solution-principle of mirror-symmetry were employed. In every single problem a rectangular, framed white panel (210 x 148 mm.) is displayed, in which two red and one black "beams" or "chips" (rectangles, 60 x 15 mm.) are affixed in a specific position. The person being tested receives another black chip of the same kind which, once placed on the panel in the correct way, completes the figure in a symmetrical manner. There is only one correct solution for each problem. For unschooled persons being tested (children of pre-school age, illiterates) the symmetry-line in each problem is indicated with the help of a straight piece of wire, and after each unsuccessful test-solution the correct solution is given before the next problem is displayed.

The Object-Relations Test

The material consists of a test-board with a ring-shaped area divided into 24 panels and 200 hard rubber stones (the size of the stone is that used in the game of "mill"). There are on hand four different kinds of stones, rectangular and round black, rectangular and round white. For the person being tested the question is to

Test Battery" for native mine workers (Vol. IX, p. 226 f.). (Tests (*g*), (*h*) and (*i*) could not be carried out for different reasons (lack of time, unfavorable climatic conditions, etc.) or could be carried out with only a few test subjects. We hope that they will be used by later expeditions).

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repeat correctly and to continue a series started by the test-instructor, in which the stones are given in a definite sequence, until all 24 panels of the problem ring are filled accordingly. Three very simple problems were given to the Bushmen: 1. The four quadrants of the ring were to be filled up each with one kind, thus with six similar stones. Pre-given are one stone each of the four kinds in the first panel of each quadrant and a second stone of the first kind in the second panel of the first quadrant; it is indicated mimically how the continuation is to be done. 2. A simple alternation of two kinds, black-cornered, white-cornered, etc., or black-cornered, black-round, etc. Two pairs are given. 3. The series black-cornered, white-cornered, black-round, white-round is given twice and is to be repeated four times.

The Ishihara-Charts

The seven charts for illiterates (a preliminary exercise and six test charts) of this well known test were employed on all the Bushmen, 81 nomadic and 46 living on farms, whom we could attract to our tests. The person being tested is called upon to recognize a pattern consisting of similarly colored spots in a mosaic of spots of different color, brightness, and size and to follow the pattern with a grass blade or the like. The color-blind or the color-incapable cannot recognize the color-pattern, since figure and background seem the same to him. He sees only a brightness pattern and loses his way in following the twisting path, whereby his deficiency is revealed.

THE EXPEDITION

From Johannesburg the expedition reached the Ghanzi District in the Bechuanaland protectorate by way of Mafeking, Francistown, and Maun (on the southern edge of the Okavango Swamps). About 115 kilometers south-south-east of Ghanzi a group of some 50 Bushmen was found by the bore-hole "Takatshwane." Another 50 kilometers to the south-south-east a still larger group of some 80 people (including children and old people) was found by the bore-hole "Lone Tree." Bore-holes and pumping stations have been constructed by the government at certain distances along the main "streets" (truck tracks in the sand) for the relief of cattle shipments and commerce. As expected in the planning of the expedition, the Bushmen had camped near the water-places. Their natural water supplies (among others, water in ostrich egg shells buried in the sand) are depleted around this time of year, at the end of the dry winter, and the pump water is consequently very welcome.

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The physiologists remained in Takatshwane in order to carry out their investigations. They measured the body and skin temperatures as well as the microclimate (conditions in the proximity of the body, at the sleeping place, etc.), in order to clarify by what means the Bushmen are in a position to endure the cold of the Kalahari winter nights—sharp frost is frequent. The remaining seven members of the expedition began their research at Lone Tree, in order to resume it later at Takatshwane and on the farms in Ghanzi. They extended to a complete recording of the racial and constitutional characteristics by the anthropologists, electrocardiographic records of the heart functions, investigations of the structure of the teeth, of mouth bacteria fauna, and of a general clinical nature by members of the Johannesburg Medical School, demographic records, and the tests of the author and his assistant. The work was actively assisted by Thamae, a young Bushman, who accompanied this part of the expedition as an interpreter. He had quickly taken up contact with his friends living in the bush and told them that they would receive tobacco, corn meal, and meat if they would appear for us and place themselves at our disposal. At first a few older men came, one or two days later the women and finally, after ascertaining that there was plenty to eat, also the younger men and hunters of the group. Chattering cheerfully, but always disciplined and behaved, the Bushmen sat in small groups, usually separated according to age and sex, around the camp of the expedition and always more or less amusedly submitted to whatever the strange white people undertook with them.

BEHAVIOR OF THE BUSHMEN DURING THE TESTS

We had expected that it would often be difficult to arouse the interest of the small people in our tests. However, in this respect we were most pleasantly surprised. Our Bushmen all participated willingly, although some got a kind of stage-fright or fear, if we asked them to come with us. In the case of the sand-drawing test, which was given at the beginning, the persons being tested in general quickly found their composure again. They crouched informally at the drawing board while Thamae gave the instructions. (Occasionally another Bushman had to be introduced if the test subject spoke a dialect not familiar to the translator.) Among the Bushmen alone three languages are spoken that differ from one another as much as French and Spanish (Maingard 1958). Usually after short reflection, more rarely after some indecision, the drawing was prepared. In the case of the Pattern-

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Completion test following thereupon, which like the following was performed without a translator, a fairly strong nervousness was often evident, especially in the first minutes. Sometimes the hands of the person being tested trembled so severely that the picking up and laying down the strip of paper caused him noticeable difficulties. However, the self consciousness very soon disappeared making way for a calm attentiveness that continued until the conclusion of the session (20 to 40 minutes for all 4 tests, according to the capacity of the person being tested). In the case of the Object-Relations Test and the Ishihara-Charts scarcely any practical difficulties occurred. Especially noteworthy was the great care with which the Bushmen manipulated the test material; in the case of the Pattern-Completion Test a single thin strip of paper survived all tests. Likewise remarkable was the grace and elegance of the movements, especially of the hands, but also when walking and doing other things. Individual differences of temperament, liveliness, timidity, talkativeness, serene composure or reserve, were at least as pronounced as in any other groups.

RESULTS OF THE TESTS

Just as the peculiarities of expression and behavior, so too varied over a wide range the capabilities revealed in the tests. There were tested in all age-groups persons who understood only with difficulty what we wanted from them, and on the other hand those to whom the situation was clear almost immediately and who hardly made errors.

The Sand-Drawings of the Bushmen are in a remarkable way limited to what is essential and extremely simplified. In contrast to this are Sand-Drawings, which we obtained from other unschooled natives, often overladen with unnecessary details, which are difficult to reproduce in the sand (like buttons, hairs, fingers and toes). The Sand-Drawings of the Bushmen, for all their simplicity, give the impression of great vivacity, whereas the detailed drawings of the natives seem ill-proportioned. Instead of the animal, the spoor is often drawn by the Bushmen (in some 11% of the drawings), or a projection of the animal (25 to 30%), that is almost a top view of the drawn figure, with the skin of the animal stretched out on the ground. Both were drawn more frequently by men than by women. The figure on the drawing-field was depicted "standing-on-its-head" in the animal drawings (almost 20%), but not as frequently as in the case of other natives. Human figures were always drawn "upright," even next to "inverted" animals in the same drawing.

Unexpectedly good results occurred in the Pattern-Completion

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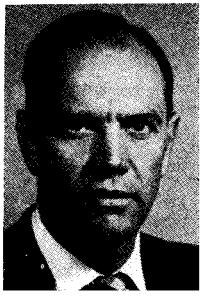
Test, although symmetry plays a very much more limited role in the environment of the Bushmen than in our culture or in other African cultures. A middle-aged woman produced the best performance with 9 completely correct and one nearly correct answer. She made only one mistake in the problem. This problem was solved only on one single occasion and therefore has to be considered as too difficult.

In the case of the Object-Relations Test the association of the two construction-principles, form and color, caused great difficulties (Problem 3), while the simple change of color or form was easily understood (Problem 2). In the case of this test the performances of the men were better than those of the women (statistically significant difference, $P > 5\%$).

We found no color blind among the 81 nomadically living Bushmen. On the other hand there was a young man (16 to 20 years old) among the Farm-Bushmen, who failed to work any of the Ishihara-Charts.

It is especially interesting that the Pattern-Completion Test showed a positive correlation of $r = 0.53$. "General Intelligence"

BIOGRAPHICAL NOTE



Helmut Reuning. Born 1914 in Swakopmund, South West Africa. Educated in Germany: Humanistisches Gymnasium Giessen (Hessen), university studies Göttingen, Giessen, Tübingen, München, interrupted by 7 years' military service, 5 years of this in the German Army at the Russian front. Joined Psychologisches Institut of Goethe University at Frankfurt am Main 1947-49. Dr. rer. nat., Frankfurt, 1951. Since 1952 at the National Institute for Personnel Research, Johannesburg, of the South African Council for Scientific and Industrial Research, where he is now Principal Research Officer and Head of the Applied Experimental Psychology Division. Research into temperament and personality problems, ergonomics and the psychological testing of illiterates. Fifteen publications, or contributions to publications, in the *Journal of the National Institute for Personnel Research*; *Studium Generale*; *Acta Psychologica*; *Proceedings, South African Psychol. Assoc.*; *South African Journal of Laboratory and Clinical Medicine* and *Umschau*. Co-Editor *Psychologia Africana*, the Journal of the National Institute for Personnel Research (formerly *Journal of the National Institute for Personnel Research*). Member South African Psychological Association; South African Association for the Advancement of Science; Institute for the Study of Man in Africa. Expeditions to the Central Kalahari, 1958 and 1959, where he tested some 250 Bushmen.

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is to be considered with great probability as the factor responsible for the correlation. The fact that the intelligence factor is revealed in both tests speaks for the reliability of the answers given by the Bushmen in the tests. These two tests also bring out a difference between the two Bushman-groups. The group at Takatshwane had better results on the average than the group at Lone Tree (statistically significant difference, $P < 1\%$). To what this superiority may be attributed in the case of a distance of only 50 kilometers between the areas in which they live cannot yet be said. There are three possible explanations to the question, perhaps all of which are valid together. 1. Racial Difference (the people at Takatshwane were on the average somewhat larger and heavier). 2. Closer contact with European civilization. Takatshwane lies on a "trade-junction-point" (if one may so name that with reference to the Kalahari), and some people there, for example, knew the value of money, which we could not observe at Lone Tree. 3. Finally a more rigid organization of the smaller Takatshwane group may have exerted a positive influence. The speaker of the group evidently possessed great authority, and his orders were respected by all. We asked him what he thought of our tests, whereupon he gave the answer: "It is a pleasant game."

Some Conclusions From Our Observations.

Originally we had wanted to mark out with these first tests only the feasibility of carrying out work on more important problems. But the success of the described experiments exceeded our expectations. These simple situations were not only suitable for gaining the unlimited concentration and serious attention of the Bushmen, but they also produced answers that perhaps permit worthwhile conclusions. It has been shown that the intellectual talent of the Bushmen living today is certainly not to be evaluated as inferior to the other African peoples. The performances of the Bushmen are of a magnitude comparable to the unschooled blacks (Negroes), even though the latter seem to possess clear advantages from superficial, short-lasting contact with European culture. Our "tests" have not been devised by Bushmen. That they have generally functioned so well is psychologically of no slight significance.

The positive results of the Sand-Drawings give for the present no support to the hypothesis that the wonderful rock paintings could not be created by Bushmen. It appears completely possible that through appropriate continuation of the tests and employment of similar means, relationships in style and expression can be demonstrated.

We should like to hope that the direction of such endeavours

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be seen not merely in the satisfaction of scientific curiosity, but also in giving the benefit of the knowledge obtained to the amiable little people. No effort should be spared to avert the hard fate of national dissolution of the Bushmen through the relentless expansion of other natives or European farmers. He who learns to know and understand the way of life so rich in wisdom of these fascinating human beings, will find a rich reward.

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RACE, LANGUAGE, AND THE HISTORY OF PEOPLES

By PROFESSOR BERTIL LUNDMAN

TRANSLATED FROM THE GERMAN BY DONALD A. SWAN

Since a clean cut distinction has generaly been made between race and language, at least during the last two generations, it might appear that there would be little more to say about the subject. But one often goes too far in denying any relation at all between race and language—whether direct or indirect. It is the principal purpose of this article to examine these questions and to clear them up with some concrete examples.

In so doing we shall not concern ourselves with the more precise definitions of the concepts of race and language, but consider them only as conventional forms of classifying humanity with respect to physical origin or linguistic nature. It is, however, self-evident that within all regions of the world that are fairly stable with respect to people and culture, there arises, gradually if not originally, a certain parallelism between race and language as a result of geographic-historical factors. This also takes place with the remaining cultural and ethno-social groupings into "nations," etc. Thus, every fairly large geographical barrier which substantially hinders intercourse and marriage also corresponds with a racial and linguistic boundary, although naturally no complete parallel can then be expected in the strength of the commercial, racial, and linguistic boundaries. This results in some of the rougher classifications of races and languages more or less coinciding. This is the case, for example, on the southern slope of the Himalayas with groups of Mongoloid racial stock speaking Tibeto-Burman languages in the north and groups of Europid racial stock speaking Indo-European languages in the south. A similar relation exists between Chinese and Koreans of Southeast-Mongolid racial type and the Tungusic and (linguistically) "Mongolian" tribes of North-Mongolid racial type to the north of them.

But today the process generally occurs in such a way that peoples and cultural movements in geographic border zones spread *one* language into the region of the other through conquest or even through cultural expansion. In the former case, as a rule, the ruling class is gradually almost or wholly absorbed anthropo-

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logically by the conquered class, who in the end more or less predominate in the upper class. In this manner, for example, the Mongol racial type in Turkey has almost completely disappeared.

In respect of language the final result is more subject to change during this process. Often the language of the conqueror gains the final victory, as, for example, the language of the Romans in almost all south-western Europe and that of the Indo-Europeans in the greater part of India. But it also happens that the language of the conquered in time wins the upper hand: such as the Slavic dialect in the case of Bulgaria, which was conquered by the Turkish Bulgars; or the Anglo-Saxon language over the French of the victorious Normans. (We cannot here enter into the more precise linguistic-cultural-historical reasons for these different end results).

These examples are at least theoretically quite simple and clear. But there are also many more complicated relationships between race and language, where the parallelism is highly uncertain or completely absent.

All human races are known to be completely fertile with one another, and—apart from the few individual exceptions in the case of the mixture of widely diverse races—the offspring are (on the average) just as vigorous as the parent races. On the other hand a mixture between different languages proves to be more difficult when the parent languages are not very closely related to one another. In other words the mixed-language individuals for the most part cannot easily convert the sounds, words, etc. of the one language into those of the other. Then a more or less complete language chaos threatens which can end in a secondary primitive language, such as pidgin-English. Usually, however, *one* language triumphs, although it may be severely weakened by the struggle. (Its sound system is frequently deranged, the accidence highly simplified, and masses of new loan words are received). But when finally the initial national and racial constituents gradually attain complete fusion, a new and apparently uniform language can result, in which only experts can observe the disparate prime constituent elements.

Hence, it follows that family trees can in general be drawn up more easily for languages than for physical human groups. Consequently, ethnologists usually make use of language in their (more practical-pedagogical) surveys of human classification and not the actually more important racial affinities.

Now what does this enormous expansion of an extremely small number of linguistic families signify? It is understood at once that in general this is made possible only by a fairly high level of cultural development, except in the case of pioneer settlement of hitherto rejected and uninhabited border regions of the inhabited

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world, such as by the Samoyeds, for example, who spread out over some 2500 kilometers and the Eskimos over almost 4000 kilometers. The initial result is not always dependent upon the absolute superiority of a once smaller original tribe over their formerly more restricted environment. For as a rule its neighboring peoples were (apart from significant exceptions) racially akin to them. Let us take one example, even if it is not perfect. Were the other Italic tribes—Umbrians, Sabines, etc.—*racially* inferior to the Romans who were gradually rising to world dominion? (We shall not speak here of the Etruscans, whose migration from distant regions is obvious also in their manifest psychological racial differences). They apparently were not—at least not until later times, when almost all capable, aspiring young men of the other tribes went to Rome—for at that time Roman superiority had been understood or recognized for some time. This was mostly caused by complicated geographic-economic factors and social traditions related to them (even if they were not brought forth wholly mechanically from them).

On the other hand no actual tribe of an existing human race had command of such powers of development as the Roman people. Or to use an example: individual giant trees can actually occur in a forest of oaks (in favorable places for their growth), but not in a forest of willows.

Still some investigators—especially American and Russian—ask if these above-named classical viewpoints relating to linguistic genealogy are really tenable with regard to the lower stages of human cultural development. According to the view of competent specialists, at least, it seems to appear as if in certain ancient regions (California, New Guinea, and in part also the Sudan) there is a multitude of what can not only be classified as exclusively different dialects (an obvious fact in the case of cultural conditions, where the ethnic units are small throughout), but also as markedly diverse languages. But these latter, however, are related to one another in a greater or a lesser degree through similarities —that appear simultaneously, in several directions! Even in the case of greater future knowledge of all these languages, they will perhaps resist all possibilities of drawing up phylogenetic trees. (We omit here all those questions that could follow from this: that this predominantly "prelogical" mentality of the speakers of the language and the like could depend on the more primitive structure of the language; for the most part I consider this scarcely possible). On the other hand we propose the hypothesis that it appears more fitting to prepare language genealogies for human groups with greater organization and more rapid expansion. To be sure there occurs a certain, although naturally unclear, line of

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separation between the language evolution within such regions where no single tribe has expanded any further than the others (other than by chance) and that where one or more expansive tribal groups have imposed their language on the others. In the first case the tribes and their languages in time fused together over a period of several millennia. They have then separated without showing a strong, perceptible tendency to a definite preponderance in any one specific direction. For the second case we have world historical examples at our disposal. The expansion of the Latin language and its later degeneration into the Romance languages of today can be mentioned. It is surprising how small is the number of language groups that prevail today in the greatest part of the Old World: while, in order to complete the picture, it may be mentioned how small also in number and extent are the remnants of the old, more primitive language-thicket which, at least in the early populated warmer regions of the world, must have concealed a thick maze of the most diverse types. (We have some knowledge of these languages in the Near East from the earliest historical times, even if this knowledge is more or less obscure and insufficient).

The significance of geographic environment has been noted in the case of the expansion of the nomadic peoples in the steppe zones of the Old World (from Manchuria through all central and south-west Asia and further through Africa to Cape Verde and the Cape of Good Hope). This has favored a very high degree of linguistic leveling, but not until satisfactory, highly mobile and durable riding and pack animals had been obtained, such as camels, horses, donkeys, oxen, etc. The entire nomadic life has accustomed these tribes to an expansive, spatial mentality and a higher degree of organization. It is evident that the hereditary characteristics of these tribes were gradually strengthened in this direction through selection, so that these qualities were later also noticeable beyond the nomadic zones. The enormous expansion attained by this means of the Semitic and Turko-Mongol peoples is generally known. The still more important expansion of the Indo-Europeans is similarly related, since a great part of them were once horse-riding nomads. But a farming people of excellent racial stock, like the Teutons, with only a more distant cultural affinity to them, can also possess a significant power of expansion. And in the long run their cultural ability appears to have been greater. The great nomads easily become over-specialized with less ability to adjust to a calm sedentary life—like certain Hamitic tribes in East Africa.

The rapid expansion of the Bantu peoples in relatively recent times (according to the ethnographers not much before the birth

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of Christ) has given a still very uniform type to almost all the languages of southern and central Africa. The "proto-people," who diffused the Bantu languages, were no doubt cattle-raising nomads, although lacking equine animals (horses, donkeys, etc.). They were also originally people of semi-Europid steppe type. The powerful expansionary drive in the 19th Century of the rarely capable Zulus, who belonged to this group (but who are for all that predominantly Negrid), is also connected with a more highly evolved type. (They often have almost as large a brain as the Europeans, while the remaining Negroes for the most part have on the average smaller brains).

Another highly expansive language family, the Austronesian (Malayo-Polynesian), has conquered the South Seas—with sailing feats that surpass those of the Vikings. The boldest of them, the Polynesians ("the Greeks among the South Sea Peoples"), also have a more or less predominant Europoid strain, which is also noticeable in their entire mental disposition and culture.

Thus we see that the large, more clearly defined language families are in general a relatively late phenomenon and are always diffiused by psychically and physically progressive groups. However, not all of the more progressive, energetic races of the world take part in this development to the same degree. This shows how complicated the entire subject is, and how many other important factors are involved: a geographic environment, which promotes expansive culture-forms; and also, as already mentioned, probably the hereditary abilities of the race. Just as a plant needs certain minimum quantities of different elements for its growth, whereby one element can be substituted for another only with difficulty, so the great "language-trees" of the world had certain minimum demands for expansion. These include, above all, psychical and physical racial ability; an expansionist educational environment; and (probably to a certain extent originating as one amongst these prerequisites, but not necessarily a mechanical result of it) an appropriate form of culture. In so doing an excess of one factor can often compensate in some degree, but never completely, for a certain deficiency in another.

Naturally these expansionist conditions have not lasted indefinitely. The conquering race has gradually become mixed, although often at first very slowly, with the mass of the enslaved tribes and peoples. The expansive cultural tradition has usually lived on for a fairly long time, partly through the alluring prospects of power, though finally being exhausted in a natural manner. This takes place not only through the dying out of the conquering race but, partly dependently and partly independently, there occurs unfortunately an almost inevitable, gradual effeminization of the

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ruling people. Nevertheless, where the goddesses of destiny have been favorable, both have lived on long enough to give certain national and linguistic groups a far and lasting expansion over the earth. The feeling of responsibility toward race and society which always rests upon a strong patriarchal foundation has certainly contributed to it. This has characterized these groups even if, as in the case of all earthly matters, not permanently, and, in spite of all blood and tears which they call forth, has given them the name of the "great of the earth"[1] ["Grossen auf der Erde"].

[1] In the pursuit of these final ethno-sociological thoughts, it has hardly been necessary for me to go into the direct influence of race upon language. This would involve possible influences of the different average palatal forms upon the sounds of the language and of the average psychical heredity of syntax and language structure in general. (Both, however, are also environmentally influenced—the palatal form less, the form of thinking naturally very strongly; but, on the other hand, the mentality of the different human groups is influenced by effective, psychical hereditary factors). Here, however, little is known and as regards much, but not all of the hitherto groping research, it must be said: "Vestigia terrent." By striving for a modern and organic conception of man and his different types and groups, some correlations must still in time be discovered.

BIOGRAPHICAL NOTE

Bertil I. Lundman, B.Sc., B.Div., Ph.D. Born in Sweden 1899, he was educated at Uppsala University, taking botany and geography in his B.Sc., 1925. He then embraced archæology, geology, old languages and theology, took B.Div. 1935, and did research into Swedish religious geography. In 1957 he was appointed Assistant Professor of Physical Anthropology at the same University.

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The Mankind Quarterly Symbol

Several people, among them one professor of anthropology who has broken into print recently against THE MANKIND QUARTERLY, have complained to the editors concerning the symbol used on the cover. They have alleged that it is evidence of racialist ideas, and that it is improper to show the head, representing the Negroids, at the bottom of the circle. One such person also complained against the use of the terms Homo Caucasicus, Homo Mongolicus and Homo Africanus.

It has, therefore, been deemed necessary to explain that the symbol is based upon scientific principles, in order to put an end to these carping criticisms and the quite improper inferences which certain persons are trying to draw from its use.

Mankind is primarily conceived of either in the anthropo-geographical terms of its distribution or in the ethnological terms of its classification in relation to types, and to descent and heredity. In our cover design both these principles have been combined to make a scientific synthesis.

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The symbol is based upon the globe, showing the Eurasiatic and African continents, and the distribution on these continents of the three principal human stocks—namely Caucasoid, Mongoloid and Negroid. However, since it is an established geographical convention to portray the North at the top, it would be a violation of all established principles to have put the South there instead by inverting the map and making the North face the bottom of the page. Had the editors been intent upon establishing symbolically the dominance of any particular stock they would have found it necessary to place one of the heads at the top, thereby showing their lack of integrity, for by so doing the North could no longer have been in its normal position at the top.

The "spoke" which faces the top of the page is to indicate the North because this north-south axis divides the main areas of characterisation of the Caucasoids and Mongoloids respectively in the Eurasiatic continent. Likewise the East and West "spokes" radiating out from the tropical regions indicate the axis along which the two light coloured stocks are separated from the Negroid.

It will, therefore, be observed that the symbolism employed forms a scientific exposition and, in so far as it exaggerates any particular race, it gives the whole of the lower half of the circle to the Negroids, although in point of fact their numbers in the world, in comparison with other stocks, do not justify this, while the Caucasoids and Mongoloids are only allotted a quarter of the circle each. Far from this being a symbolic representation of race which is weighted against the black races, it is the direct contrary. However, such criticism which the editors have received on this issue indicates how far racial-nationalism or racialism (call it what you will) will go in imputing motives which do not exist, and in deliberately misreading the plainly objective and scientifically integrated symbology used as the emblem or device of THE MANKIND QUARTERLY. Presumably nothing will satisfy such mentalities which can so distort factual evidence but the turning of the symbol upside down, to put the South at the top, with the figure of the Negroid man bestriding the globe.

The editors are of the opinion that they would be lacking in integrity if they gave way to this curious criticism either by changing the device—which has become well known and indicative of THE MANKIND QUARTERLY wherever it is read—or by withdrawing it.

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OUR CONTEMPORARIES

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POPULATION

Quarterly review of the Institut National d'Etudes Démographiques, 23 avenue Franklin-Roosevelt, Paris 8. Annual subscription NF 14.

Vol. XVI, No. 3, July-September 1961.

Vues prospectives sur la population active par département de 1960 à 1970, by Roland Pressat; Dix ans d'expérience de prévision de l'emploi, by Françoise Leridon; L'aspect démographique des problèms de l'isolat, by Jean Sutter and Jean-Michel Goux; Prévision pour l'année 1975 sur la population italienne selon la qualification professionelle et l'instruction, by Nino Novacco; La population de la Tunisie. Situation actuelle et évolution probable jusqu'en 1986, by Mahmoud Seklani; L'analyse démographiques: Méthodes, résultats, applications, by Roland Pressat; Le Tiers Monde. Sous-développement et développement, by Alfred Sauvy; Reviews, etc.

NATIONAL GEOGRAPHER

Published by the Department of Geography, University of Allahabad, India. Editors Dr M. N. Khan and Dr R. C. Sharma.

Vol. IV, May 1961.

Applied Geography: A Proposal for Establishment of the Departments of Applied Geography in Indian Universities, by Dr S. M. Ali; India's Changing Villages, by Professor G. H. Lawton; Geography and Indian Religion, by Dr A. N. Bhattacharya; Geography and Geophysical Research Today, by Dr I. P. Gupta; Definition and Scope of Oceanography, by Miss Meera Vatal; Soils of the Bist Jullunder Doab, Punjab, by Dr O. P. Bhardwaj; The Economic Geography of Cattle Raising in Andhra Pradesh, by B. N. Chaturvedi; The Drainage Disabilities and Flood Problem in the Tarai Region of Uttar Pradesh, by Dr L. R. Singh; Allahabad: a Study in Industrial Development, by Dr R. L. Dwivedi; Location of a Sugar Mill, by R. N. Tewari; Tea Industry of India, by Dr M. N. Khan.

PLAINS ANTHROPOLOGIST

Journal of the Plains Conference. Published at the University of Oklahoma, Norman, Oklahoma. Annual subscription $2.00.

Vol. VI, No. 12, May 1961.

Field Reports; The Threat to Nubia, by John O. Brew; Conference Reports; Elias Howard Sellards, 1875-1961, by T. N. Campbell.

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Vol. VI, No. 14, November 1961.

The Fort Lookout Trading Post Sites: A Re-examination, by Harry H. Anderson; A Site in the Fort Randall Reservoir, Brule County, South Dakota, by Ward F. Weakly; The Independence Road to Fort Laramie: By Aerial Photography, by Thomas Morley; The Comanche Kinship System in Historical Perspective, by Stanton K. Tefft; Reviews, etc.

THE PSYCHOLOGICAL RECORD

A quarterly journal in theoretical and experimental psychology. Editor, Irvin S. Wolf, Denison University, Granville, Ohio. Annual subscription $4.00.

Vol. XI, No. 4, October 1961.

Selective Attention and the Müller-Lyer Illusion, by Riley W. Gardner and Robert I. Long; Inclusion, Exclusion, Emphasis: Selection in the History of Psychology, by J. A. Cardno; Behavior Variability and Reactive Inhibition in Human Stylus Maze Behavior, by George E. Rice, Jr. and Richard H. Lawless; Ph.D's in Psychology who Functioned as Clinical Psychologists between 1896 and 1910, by J. E. Wallace Wallin; Sensory Deprivations and Some Therapeutic Considerations, by Malcolm H. Robertson; Percentage Timing Reinforcement Schedules, by Robert C. Bolles; Intervening Constructs: The Problem of Functional Validity, by W. W. Meissner; Stress and Anxiety as Homomorphisms, by Lewis R. Aiken, Jr.; Perspectives in Psychology XIX: Private Experience Revisited, by Joel Greenspoon; Whittaker's "Postulates of Impotence" and Theory in Psychology, by T. W. Wann and D. E. Walker; Frequency of Reinforcement and Preliminary Training Conditions as Determinants of Extinction, by H. M. B. Hurwitz; Toward a Unified Psychology, by Leo L. Gladin; A Classroom Demonstration of "Extra Sensory Perception," by N. H. Pronko; The Measurement of Hypnotic Effects by Operant-Reinforcement Techniques, by C. B. Ferster, E. E. Levitt, J. Zimmerman and John Paul Brady; Reviews, etc.

THE EUGENICS REVIEW

Quarterly journal of the Eugenics Society, 69 Eccleston Square, London, S.W.1. Annual subscription £2.

Vol. LIII, No. 3, October 1961.

Notes of the Quarter; The Impending Crisis, by Julian Huxley; Cousin

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Marriage and Population Structure, by C. D. Darlington; Voluntary Sterilization: Introduction and Summary, by C. P. Blacker; The International Planned Parenthood Federation: Part I, by Vera Houghton; Notes; Reviews; Correspondence.

Vol. LIII, No. 4, January 1962.

Notes of the Quarter; Eugenics and the Family, by W. R. Matthews; The International Planned Parenthood Federation: Part II, by Vera Houghton; Second International Conference of Human Genetics; The Eugenics Society of Victoria (1936-1961), by Victor H. Wallace; Notes; Reviews; Correspondence.

RACE

Journal of the Institute of Race Relations. Published twice yearly by the Oxford University Press. Annual subscription £1.

Vol. III, No. 1, November 1961.

The Student of Race Problems can say . . . , by Margaret Mead; Dusky Venus, Black Apollo, by Roger Bastide; The Treatment of Prejudice in Contemporary Education, by James L. Henderson; Community Conflict in New Zealand: A Case Study, by Richard Thompson; Negroes in Canada, by Harold H. Potter; Black Muslims: A Nativistic Religious Movement among Negro Americans, by William A. Shack; Race and Nationality in Europe, by Jan Czekanowski; The Joint Conference on Research in Race Relations in Britain; Reviews; Notes, etc.

Books Received

ANNUARIO DELLA ACCADEMIA PONTANIANA, 1961

Published by the Accademia Pontaniana, Via Mezzocannone 8, Naples.

ATTI DELLA ACCADEMIA PONTANIANA

Published by the Accademia Pontaniana, Via Mezzocannone 8, Naples. Vol. IX, 1959-60.

RENDICONTO DELL'ACCADEMIA DELLE SCIENZE FISICHE E MATEMATICHE

Published by the Società Nazionale di Scienze Lettere ed Arti, Naples. Vol. XXVII, January-December 1960.

ATTI DELLA ACCADEMIA DELLE SCIENZE FISICHE E MATEMATICHE

Published by the Società Nazionale di Scienze Lettere ed Arti, Naples. Vol. III, 1960.

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REVISTA DE ESTUDIOS POLITICOS, November-December 1961.

REVISTA DE POLITICA INTERNACIONAL, May-June 1961.

REVISTA DE ADMINISTRACION PUBLICA, May-August 1961.

REVISTA DE POLITICA SOCIAL, October-December 1961.

REVISTA DE ECONOMIA POLITICA, September-December 1961.

All published by the Instituto de Estudios Políticos, Plaza de la Marina Española 8, Madrid 13.

POPULATION

Published by the Institut National d'Etudes Démographiques, 23 avenue Franklin-Roosevelt, Paris 8. Vol. XVI, No. 4, October-December 1961.

DE LA TRADITION ORALE: ESSAI DE METHODE HISTORIQUE

By Jan Vansina. Musée Royal de l'Afrique Centrale, Tervuren, Belgium, 1961. Pp. 179.

BIBLIOGRAPHIE ETHNOGRAPHIQUE DU CONGO ET DES REGIONS AVOISINANTES, 1959

Published by the Musée de l'Afrique Centrale, Tervuren, Belgium, 1961. Pp. 381.

RECHERCHES SOCIOGRAPHIQUES

Published by the Département de Sociologie, Faculté des Sciences sociales, Université Laval, Québec. Vol. I, No. 4, October-December 1960, Vol. II, No. 1, January-March 1961.

ERGEBNISSE DER DEMOGENETISCHEN ERFORSCHUNG DER ISOLATE MIT BESONDERER BERUCKSICHTIGUNG DER SCHWEIZER INZUCHTGEBIETE

By Ernst Hanhart. Extract from *De Genetica Medica*, Istituto Gregorio Mendel, Rome, 1961.

SULLA DURATA DEL PERIODO PRE-OVULARE E DELLA GESTAZIONE DEI DUE SESSI

By Corrado Gini. Extract from *Biometrische Zeitschrift*, Vol. III, No. 1, 1961, Akademie-Verlag, Berlin.

DE L'INFLUENCE DE L'EXERCICE SUR L'EVOLUTION DES ORGANES: UNE THEORIE SUB-LAMARCKIENNE DE L'EVOLUTION

By Corrado Gini. Extract from *Acta Geneticae Medicae et Gemellologiae*, Vol. X, No. 3, 1961.

LE FUNZIONI DELLO SPORTO E L'IMPIEGO DEL TEMPO LIBERO

By Corrado Gini. Extract from *I Problemi della Sicurezza Sociale*, Vol. XVI, No. 2, March-April 1961, Istituto Nazionale Per L'Assicurazione Contro Le Malattie, Rome.

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National Academy of Sciences, India, Lajpatria Road, Allahabad 2.

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PROBLEMS OF THE PEOPLES OF THE USSR

Published by the League for the Liberation of the Peoples of the USSR, Munich. Nos. 9, 10, 11 and 12, 1961.

PICTORIAL DEPTH PERCEPTION IN SUB-CULTURAL GROUPS IN INDIA

By W. Hudson. Extract from *The Journal of Social Psychology*, Vol. LII, 1960.

THE GATHERING STORM

By Winston S. Churchill. Penguin Books, 1960. Pp. 734. Price 7s 6d.

UP FROM LIBERALISM

By William F. Buckley, Jr. Introduction by Senator Barry Goldwater and foreword by John Dos Passos. Hilman Books, New York, 1961. Pp. 224. Price $0.75.

ON THE NATURE OF MAN: AN ESSAY IN PRIMITIVE PHILOSOPHY

By Dagobert D. Runes. Philosophical Library, New York, 1956. Pp. 105. Price $3.00.

LETTERS TO MY TEACHER

By Dagobert D. Runes. Philosophical Library, New York, 1961. Pp. 105. Price $2.75.

HUNGER: CAN IT BE AVERTED?

Edited by Sir E. John Russell and Dr Norman C. Wright. The British Association for the Advancement of Science, 3 Sanctuary Buildings, Great Smith Street, London, S.W.1, 1961. Pp. 80. Price 5s.

THE POWER OF THOUGHT

By Geo. W. de la Warr. Reprint of a paper read to the Oxford University Scientific Society, May 1961.

INTERNATIONAL JOURNAL OF COMPARATIVE SOCIOLOGY

Published by The Department of Social Anthropology, Karnatak University, India. Vol. I, No. 2, September 1960.

THE HISTOMAP OF HISTORY: THE RISE AND FALL OF PEOPLES AND NATIONS FOR FOUR THOUSAND YEARS

Folding coloured chart by John B. Sparks. Published by Rand McNally & Company, New York, 1959. $1.50.

TRANSACTIONS AND PAPERS, 1961

The Institute of British Geographers. London, 1961. Pp. 244. Price 40s.

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Book Reviews

MANUAL OF PHYSICAL ANTHROPOLOGY

By Juan Comas. Charles C. Thomas, Springfield, Illinois: Blackwell Scientific Publications Ltd., Oxford, 1960. Pp. 775, 116 figures, 97 Tables. Price £7.

The publishers introduce this book by saying that the author "not only cites recent publications but stresses points of view widely held today and contrasts them with those of the past," and they go on to say that "all data is presented *from a broad and all-inclusive viewpoint*." Among the list of items advertised as included in the Appendix and specially referred to on the dust-jacket is "Statement on Race (UNESCO, 1951)."

Now certain parts of this book are quite unexceptionable—where the author is merely retailing what are the various techniques and methods, and the general apparatus of physical anthropology and related subjects. But, as the publishers' advertisement on the dust-jacket indicates, the author appears to set store by his broad and inclusive viewpoint and the fact that the work contains in the Appendix an item of some importance, namely the Statement on Race by UNESCO in 1951.

Taking this last point first. What is the purpose of including in what we are entitled to consider a serious text book a statement which, at the best, is only an affirmation of faith—faith of a very limited group of scientists, some of whom are well known for extremist views which err as much from the mean as those held by the Hitlerites did in the opposite direction? In a scientific age there should be no question of scientists being called upon to observe a corpus of *doctrine*, which is set up as the "theology" of "accepted" science, any deviation from which is heresy to be summarily dealt with by persecution and excommunication. But that is all that the inclusion of such a statement can mean. It symptomises much of the work and exposition of the last decade or so, in which writers, often claiming to be scientists, are more concerned with the ethical and political considerations which arise from scientific findings that they are with truth itself. All experience and morality has, however, shown us that truth must not be distorted and twisted for the sake of political or other expediency.

The author lashes himself into indignant denunciations of those who use the term "blood"—such as in blue blood, plebeian blood, white blood, black blood and the like (p. 168). This would be amusing if it were not so sad. It is part of the author's self-imposed dedication to use anthropology as an instrument of racial-egalitarianism, of which the book reeks. But this question of racial-egalitarianism is not a scientific fact which comes within the field of physical anthropology at all, but a purely political concept which should have no part in scientific exposition in a manual in this discipline. Of course no one today believes that the heredity is transmitted in the blood, in the old-fashioned way it was once thought to have been, but the fact of the matter is that the term is now used in a general sense, because it is old and because it is convenient to cover in many cases what might be meant by heredity or genetic

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constitution or by similar subjects. We still talk of persons' fortunes being at the nadir, or their stars being against them, or of their having influenza, without feeling the need to whip ourselves up into denunciations against mediæval astronomical conceptions. I, for one, will continue to talk of the blood in its generally received sense despite the Comas embargo on it.

It may be unkind to point out Comas' own lapses—his use of this heretical term "blood" in "individuals of mixed blood" on page 168 and in "Polynesian-English mixed bloods" on page 170.

At page 169, after this performance on the "blood," the writer goes on to say that "it is beyond dispute that all the major races are of hybrid origin, and during the millenia which have elapsed since the original fission of the basic human stock, crossings have gone on continuously." It all depends on what one might call major races and that, in the passage concerned, the author does not deign to explain. But if by that he means that the Nordics for instance are the result of a cross with the Negroids, Australoids, Hottentots, Bushmen or the Mongoloids or their immediate ancestors, it is manifestly untrue. Whatever the matrix from which the Nordic strain was selected (in the original stock or even amalgam which we might call proto-Caucasoid), long isolation in northern latitudes, during more than one ice age, and over a space of time which might well have been 50,000 years, produced a selected and homogeneous stock which we are justified in calling a race or breed—which was as pure as any animal breed, for which we normally use such a description—without too great a violation of the truth. We have taken this one stock as an example, but others could have been selected to illustrate the same viewpoint—such as Bushmen or Australoids.

Let there be an end to this type of pompous, pseudo-scientific nonsense; if Comas can produce evidence that such races are the result of cross-breeding in the first instance, and have remained cross-bred throughout in any considerable degree, then let him produce the evidence. We are entitled to have it, and to have it set out in great detail, and set out with that overwhelming weight of evidence that if there were a legal action no judge and jury would hesitate to give an unreserved judgement in his favour. If this cannot be done, and we say it cannot be, as there is no substantial evidence for such a viewpoint (where major or distinct racial groups of ancient standing, clearly definable type and distinct environment are concerned), then let us have some scientific objectiveness for a change—and let writers of such statements put them not into manuals of physical anthropology, or any other works of scientific pretentiousness, but into political tracts published for the points of view for which they are the self-appointed "hot gospellers."

On the same page to which we have referred already there appears a typical statement which, before reading this, one would not have believed could have been written by anyone with any ethnological knowledge at all, unless it was designed to mislead and bamboozle the student for whom the work has apparently been written. This wonder of ethnological exposition reads as follows:

"By way of example of cross-breeding in what are accepted as civilized nations, England from the earliest times was occupied by human groups of the Cro-Magnon type and by Nordics, Mediterraneans and Alpines, and in later epochs was invaded by Saxons, Norwegians, Danes and Normans. Thus, far from being able in our day to speak of a pure English race, what we have is an excellent example of a racial mosaic."

The reader will observe that at the outset of his statement Comas refers to certain established racial divisions of ethnology as having con-

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tributed to the racial composition of the English. No one denies that, or would do so. Then he goes on to show how much more mixed they are than that, by the admixture of Saxons, Norwegians, Danes and Normans! But who, other than Comas, would dare to use, in a statement which is pretending to be ethnological, and so far ethnologically exact, a series of terms of no ethnological significance to bolster his argument, and prove thereby the increased hybridisation as a consequence? This is not scientific method and it is not scientifically objective. Can this writer possibly be so abysmally ignorant of ethnology that he actually believes that he can use terms like Saxons, Norwegians, Danes and Normans as evidence of further "racial" admixture? Furthermore it is hardly an accident that he took these four tribal groups which entered England and turned them into "races." For it so happens, speaking in general terms, these four groups were overwhelmingly of the same blood as the previous inhabitants, and, in so far as they belonged mainly to any single race, it was to the Nordic; and so they provide no evidence of further hybridisation or admixture in the amalgam which makes the Englishman. We suggest that it is difficult to conceive that Comas did not know this all the time. But to have said so would not have provided the "example" which he wanted, so it was necessary for him to jump from a scientific terminology to one of history, and yet, at the same time, to suggest that the terminology was being used in the same scientific sense as Cro-Magnon, Nordics, Mediterraneans and Alpines, in order to make the devastating point that the Englishman is an excellent example of a racial mosaic.

That we have not been too hard on Comas, when we protest that the whole of his attitude and method is unscientific and has no place in a scientific exposition of physical anthropology, is proved surely by the section (pp. 172 ff.) which is headed "Color Prejudice." We want to know what this subject has to do with a scientific text-book. It is a justifiable subject for discussion in sociology or social anthropology as well as other branches of the social sciences—but it has absolutely no place in a scientific exposition of the physical aspects of anthropology and ethnology. The very fact that this subject has been dragged in here by the heels illustrates that the author is obsessed, as we have already made clear, not with scientific exposition at all, but with using his interpretations of science for political and sociological ends. Like so many writers of this kidney, he sets out in the turgid pages which follow that there are no "completely good" or "completely bad" groups of humanity (p. 186), or that no particular race is completely superior or inferior; and having made these trite remarks, which no one in scientific circles anywhere so far as I know contests for one moment, he then intones that such beliefs are the marks of the racist. After which *obiter dicta* he then hastens to add that "racism is quite a different matter from mere observation of the facts about race and the present inequality of human groups or from the objective, scientific study of the subject." Since the whole basis of classification must rest essentially on differences, it would be very strange if such studies were what he calls "racism." But when writers in this publication have done just that, it is Comas, of all people, who howls to High Heaven that THE MANKIND QUARTERLY is racist! However, we soon find out why, when we read the rest of his definition, for he says "racism implies the affirmation that this inequality is absolute and unconditional, *i.e.*, that one race is inherently and by its very nature superior or inferior to others quite independently of the physical conditions of environment and social factors" (p. 186).

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As we have already said we do not know of any scientists who say that any particular race or group is absolutely in all its characters superior or inferior. At any time one can only speak of the characters under investigation. Nevertheless we can say that one species of animals is, in respect of a particular character, absolutely superior or inferior to another, quite independently of physical conditions of environment and social factors. We imagine that, for instance, the springing ability of the tiger as compared with that of the elephant is not influenced in any appreciable manner by either environment or social factors today, whatever effect they might have had in the course of evolution. Consequently, since this is so, there is nothing inherently evil, and certainly nothing inherently unscientific, in claiming that there are differences in certain characters in man between one racial group and another. Therefore to employ the term racist for such exposition shows that Comas' definition of racist is not an objective one at all but is entirely subjective, like so much of that of which we have complained, and has been created as a "smear" against those whose scientific work and conclusions might threaten favourite political theories and ends. Never before was there an age when it was truer than it is today to say that for so many men pretending to scientific standing THE END JUSTIFIES THE MEANS. We venture to suggest that books like this one will take their places on the shelves side by side with those of the Nazi *Rassenampt* as examples of how political thought invaded and distorted scientific truth and objectivity in the middle of the twentieth century. To us it does not seem to matter whether the distortions are for the purpose of justifying *Nazism* or *Democracy* or *Communism* or any other subjective end. All such expositions are fundamentally untrue to a real understanding of the physical nature of man. If pre-conceived political theories had not been allowed to distort the ethnological syntheses in this book, and had these resulting distortions been deleted it could have been a useful handbook for student and general reader alike.

R. GAYRE OF GAYRE.

THE THIRD STATISTICAL ACCOUNT OF SCOTLAND

General Editor George S. Pryde.

Vol. I: *Ayrshire*, by John Strawthorne and William Boyd; Vol. II: *Fife*, by Alexander Smith; Vol. III: *East Lothian*, by Catherine P. Snodgrass; Vol. IV: *Aberdeen*, by Hugh Mackenzie; Vol. V: *The City of Glasgow*, by J. Cunnison and J. B. Gilfillan; Vol. VI: *The County of Dunbarton*, by Margaret S. Dilke and A. Templeton; Vol. VII: *The County of Aberdeen*, by Henry Hamilton; Vol. VIII: *The County of Lanark*, by George Thomson; Vol. IX: *The County of Argyll*, by Colin MacDonald. Published by Oliver and Boyd, Edinburgh (Vols. I-IV), and Collins, Glasgow (Vols. V-IX), 1951-61. The prices vary, but are generally from about 42s to 50s. The volumes are large and range from 600 to 900 pages approximately per volume and are adequately illustrated with photographs, diagrams, maps, charts and tables.

Between 1791 and 1798 Sir John Sinclair, a baronet from the North of Scotland, prepared the first *Statistical Account of Scotland* which was, as the author explained at the time, an enquiry into the state of Scotland. This is an invaluable work for Scotland at that period and runs to 21

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volumes. Later, between 1834 and 1845, an equally valuable production occurred in the second. or new, Account of Scotland under the name of the *New Statistical Account.*

The value of these two works has indicated the importance of having a similar production for the twentieth century. Now, under the sponsorship of The Scottish Council of Social Service, who have shown considerable initiative and foresight, and backed by the universities and local authorities, this splendid work, *The Third Statistical Account of Scotland,* has begun to appear. When it is complete we shall have as good an account of Scotland in the latter half of this century as it is possible to expect.

The earlier statistical accounts were largely the work of parish ministers. Although each volume in the present series has an editor, many of the sections dealing with the parishes are still the work of their ministers.

In the extremely comprehensive volume V, dealing with Glasgow, there is a chapter by Dr John Highet with the title "Social Relations: Religious and Racial Relations." In it he draws attention to the fact that there is very little prejudice against the Indian and Pakistani minorities in the city. We believe, however, that he draws the right conclusion when he says: "This is not necessarily a tribute to Glasgow's enlightenment: doubtless things might be otherwise in a more competitive economic situation and if the city's coloured inhabitants were more numerous. For example, the Rev. A. Scott Hutchison tells of the reluctance of Glasgow landladies to take in overseas coloured students as boarders—out of 1350 landladies on the University list only 60 have stated their willingness to accept overseas students—and if the majority of Glasgow's citizens were similarly placed in a situation in which their social relationships with coloured people were of this regularly direct and personal kind, no one can be confident that something like the beginning of widespread colour prejudice might not show itself."

Jewish-Christian relationships are discussed, as are Roman Catholic and non Roman Catholic, and in relation to the latter, the association of the Celtic Football Club and the Rangers respectively, and the brawls and fights which are popularly known to take place between some of the followers of these teams.

In this single volume there are no less than 164 tables dealing with anything from the tonnage of ships built, to infant mortality rates, illegitimacy, housing and everything important to the life of a great city.

In the volume on Lanarkshire, the Rev. William McGregor, in writing upon the parish of Crawfordjohn, reminds us of the visit of James v and his consort Marie de Louraine to the parish and suggests that it was in connection with the nearby gold mines on Crawford Moor.

Despite the great effect all over the British Isles of changes in the way of life due to the cinema, wireless and television, and the impact of aspects of American ideas, expressions and music, the volume dealing with Aberdeenshire is able to record—in the chapter dealing with the parish of Kincardine O'Neil by the Rev. D. M. L. Urie—that the local Scots dialect is still the principle medium of communication. Although many customs have disappeared, the first footing on Hogmanay, the feet-washing of the bridegroom on the eve of his marriage and the Hallowe'en customs have survived.

In *The County of Dunbarton*—volume VI—by Margaret S. Dilke and A. A. Templeton, there appear important accounts of the Clyde shipbuilding, as well as a useful discussion of the general economy of this region which is spread out along the frontage of the Clyde. Whereas in Scotland as a whole only 9.2% are engaged in shipbuilding, in this county 41.8%

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are employed in it and the related engineering industry. Nevertheless, it would be a mistake to imagine that this county is all industrial, for its northern border runs along the southern shore of Loch Lomond, and looks northwards into the Highlands. It is therefore a county of wide contrasts.

A county of quite another character is dealt with in Dr Snodgrass' *East Lothian*, volume III—a rich arable county, ethnically as Anglian as Dunbartonshire is Brythonic in origin. The treatment of the underlying geography and the development of its history, population movements and the demography in general are very well done. The nature and form of the arable farms are illustrated with several useful diagrams of their layout.

In volume II, edited by Alexander Smith, concerned with the county of Fife, the working-class house of 1950 is illustrated with detailed plans. This might seem at first sight superfluous, until we consider that many of them may not exist at all in a century or so from now when the majority of the Scottish people may well be living once again in flats—the traditional Scottish form of housing outside the rural areas. The sprawl of suburbs round the Scottish towns, small single dwellings in little gardens, is really the result of English influence coming from South of the Border. It is obviously so wasteful a use of land and involves so great an increase in overheads (communications, power, light, water drainage and so on) that one may well doubt if it can possibly be extended much further into urban areas.

Fife is a county of great variety, from mines in the east to delightful small fishing and coastal towns along its southern coast, culminating in the most important of them all—St Andrews, with its famous university, the oldest in Scotland, whose students wear the scarlet papal gown in token of the fact that their university was founded by Papal bull.

Volume I by John Strawhorn and William Boyd deals with Ayrshire. The authors have imaginatively used the Burgh arms to illustrate each burgh, and incidentally to assist discovery of the section dealing with it. Among the minor but interesting details which may be culled from this work is the fact that the first Masonic Lodge in Scotland is that of Kilwinning, which is traditionally associated with the building of the great abbey at this place. From here masonry has spread throughout the world.

In volume IV, dealing with Aberdeen City, edited by Hugh Mackenzie, there is an interesting section given up to the way of life. This lists such matters as the typical names of the place, religious habits, superstitions, social life, home life, customs, fairs, festivals and the like. In discussing marriages, the statistics given show that between 1930 and 1947 Church of Scotland marriages fell from 68.8% to 60.9% and Roman Catholic marriages rose slightly from 4.3% to 4.4%, but the only two other forms of marriage which showed any substantial increase were the Episcopal Church marriages which advanced from 3.8% to 6.2% and the irregular forms of marriage which went up from 17.9% to 24.1%. It is interesting to learn for instance that in Aberdeen Roman Catholicism has not been subjected to the antagonism experienced in some other parts of Scotland. On the whole, church attendance although in recession is still high, as it is still throughout Scotland compared with England. For instance in Aberdeen it is 67% of the population, in Edinburgh 65% and in Glasgow 57%.

Volume IX, dealing with the county of Argyll, edited by Colin M. MacDonald, shows a sharp contrast from the eastern counties. For example the climatic statistics show mean averages which scarcely fall below

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40 degrees Fahrenheit and fail to reach 60 degrees throughout the year. The rainfall is heavy throughout the year with a winter maximum. All this indicates the mildness of the climate of the western coast of Scotland, despite its notherly latitude. Among the facts of a historic, genealogical and ethnic nature provided by this volume we read that, whereas in Scotland as a whole the surname Campbell takes seventh place (Smith is first of course), in Argyll it takes the first position, followed by MacDonald, MacLean and MacMillan. Within this county is Iona, the sacred isle of Scotland to which Christianity was brought from Ireland by St Columba, from whence it spread to the mainland and ultimately to the north of England. Due to the influence of the Earls of Argyll (Chiefs of Clan Campbell), who strongly espoused not only the Reformation but Presbyterianism, this county became a stronghold of that faith and so remains overwhelmingly Church of Scotland to the present time. The proportions which emerge from this work between the Church of Scotland, the Episcopal Church and the Roman Catholic Church are approximately 15:2:3 respectively. In this county in 1951 20.7% spoke Gaelic, as compared with Ross and Cromarty where the figure was 41.8%, Inverness 27.9% and Sutherland 24.0%.

Besides small maps in the text, photographs and tables of statistics in the appendixes, each of these volumes contains a large-scale folding map. From this brief description of the type of material to be found in these volumes of the *Third Statistical Account of Scotland* it is quite clear that they are essential works of reference covering a wide range including geography, topography, demography, history, language, sociology, economics and material relevant to ethnological studies.

THE DISPOSSESSED: A STUDY OF THE SEX-LIFE OF BANTU WOMEN IN AND AROUND JOHANNESBURG

By Laura Longmore. Jonathan Cape, London, 1959. Pp. 334, 2 maps. Price 30s.

Laura Longmore has written a most important contribution to this subject. It is a very careful and restrained study of the effects of the migration of Native labour from tribal areas to the neighbourhood of Johannesburg, to work in the mines and industrial undertakings of a modern European city. The book is extremely objective, and is free from the doctrinaire and crusading tirades which mar so many books published today which have to deal directly or indirectly with inter-racial questions. Consequently, even if one does not always accept her conclusions, or even some of the premises from which she reasons, no one can condemn this as a bad book and every fair-minded person will welcome it as a contribution to the literature on the subject.

What seems to be the outstanding fact which comes from this careful study is that the impact of White civilisation upon the Black has been bad. The quest for easy money on the part of the Native, which brings him to the industrialised European urban belts, breaks up the tribal life, and the tribal morality. All the landmarks by which people of one ethnic group and civilisation guide themselves in their conduct each to each, and all to strangers, are obscured, if not entirely obliterated. Meanwhile, hardly anything worth while is absorbed from the European civilisation which has attracted the immigrant labour; indeed, the story which this

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book brings out all too clearly is that they absorb the vices of the Europeans. The cinema comes to set the standards of what is desired by the Bantu women, and the easy-going morality, or immorality, which they absorb from this source and from the practice of Europeans whom they see in daily life, finds its expression in a complete dissolution of Bantu morality. Marriage, which is important in tribal society, ceases to be a thing of any importance at all. Whereas in tribal society there are no free women in the sense of being unmarried, the shanty towns and even better regulated settlements in these industrial regions are filled with women who are not anchored by marriage, and who in many instances have no intention of being—while the men are promiscuous to a very considerable degree.

If any book is a condemnation of what happens when tribal society and advanced western civilisations come together, this is. These considerations are also a condemnation of the capitalist support of such conditions, which provide cheap and unlimited supplies of labour, and which, as a consequence, explain the so-called "liberal" views of the business classes in the industrialised parts of South Africa. For them, this multi-racial society, with all it means in the degradation of the Bantu who come under its influence, is an absolute necessity—otherwise, if segregation (apartness or apartheid) is applied it means that cheap Black labour will have to be replaced by expensive mechanisation on a vast scale on the one hand, supplemented by expensive White labour, on the other.

Since matters of the spirit, the preservation of a people's way of life, and their traditions which have been worked out in the light of thousands of years of experience of that ethnic group, in relation to their environment and within the limitations of their own heredity, are of more importance than the transitory gains from economic sources, it seems clear that it will be in the interests of the Bantu themselves if their economic exploitation in the industries of South Africa can be prevented.

Separate ethnic development is obviously the only solution, no matter how expensive this may be, and no matter how limiting it may be to the industrialisation of South Africa. The deleterious impact of the worst aspects of European culture upon the Native peoples of South Africa must be prevented as far as possible, and Bantu society must be encouraged to propagate its own ideas and moral codes in the new era into which it is advancing. What is so astonishing is that moralists, "liberals" of every kind, and Churchmen in vast numbers, are prepared to tolerate these conditions, described so ably and graphically by Lora Longmore, which are just those which they should condemn, while, at the same time, they become hysterically emotional when any suggestion is made that the only obvious road from the long term point of view for the well-being of the Bantu is one of distinct development along their own line of advance. It is astonishing to find that Churchmen, Communist materialists, and international capitalists are at one in favouring the present evil conditions which the evidence in this book shows have developed in a multi-racial industrial society, but are loudly condemnatory of the only obvious alternative which is feasible and fundamentally and morally right—of allowing another people the economic freedom to develop their civilisation at their own pace, based on their own customs, traditions and moral principles, which in the past, and even today, where unaffected materially by impact with the Whites, have produced stable societies.

R. GAYRE OF GAYRE.

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DICCIONARIO DE FILOSOFIA Y SOCIOLOGIA MARXISTA

By P. Judin and M. Rosental. Editorial Senaca, Buenos Aires, 1959. Pp. 119.

With this text the reader is afforded an introduction to the vocabulary of Marxist sociology and philosophy. Because of its nature as a dictionary, the volume cannot pretend to answer many of the questions it raises and can, consequently, only serve as a preamble to the systematic study of Marxism as a science of man and the society and systems of thought which he fashions.

The book is a translation out of the Russian and as such gives access to a significant statement of the predispositions of contemporary Soviet thought. Unfortunately, the text is already dated by recent events in the Communist world. Stalin, for example, whose memory is being assiduously expunged from Soviet consciousness, is cited in this brief text no less than twenty two times. Furthermore, much of the discussion, particularly with reference to philosophy and its history, is either mistaken or trivial. Feuerbach is, without qualification, identified as a "materialist" (particularly pp. 36, 71; compare Lange, *History of Materialism*, II, pp. 247 f.), and it is held that Berkeley denied the "existence" of the "external, objective world" (p. 104; compare " . . . it is plain that things have an existence exterior to my mind . . . ." Berkeley, *Three Dialogues between Hylas and Philonous in Opposition to Sceptics and Atheists*, Third Dialogue, *passim*.).

Perhaps the single most important consideration, for our purposes, is the fact that a rather explicit statement concerning the nature of scientific inquiry is provided. Science is conceived as an element of "social consciousness," *i.e.*, the "ideological" (pp. 54, 79) "superstructure" of society (pp. 11, 39), which, in turn, is *determined* (pp. 78 f.; particularly p. 99) by property relations (the ownership and disposition of the means of production which rests upon the development of the "productive forces"—*cf.* p. 41). To phrase it otherwise: the productive forces give rise to property relations which are "necessary," *i.e.*, independent of the will of men (*cf.* Marx, Preface to *A Contribution to the Critique of Political Economy*, Marx, Engels, *Selected Works*, Moscow, Foreign Languages, 1955, Vol. I, pp. 362 f.). Productive relations then give rise to the social consciousness of which science constitutes a part (*cf.* pp. 54, 78 f.). The forms in which social consciousness articulates itself (politics, science, religion, morality, etc.) always express economic class interest (p. 54). There is no "independent" social consciousness (*cf.* p. 100). Ideologies arise "as a reflection of the conditions prevailing in the material life of society and of the interests of a determinate class" (p. 54).

We have, then, not only a class politics and philosophy (*cf.* p. 38) but a *class science*, as well! What this means, literally, is that at least one critically important measure of the worth of a scientific theory is its serviceability as a weapon in class warfare (*cf.* pp. 62 f.).

Marxist morality is "subordinate to the interests of the class struggle of the proletariat. . . . 'At the basis of communist morality is consideration of the consolidation and realization of communism' (Lenin)" (p. 87; *cf.* also Lenin, *On Socialist Ideology and Culture*, Moscow, Foreign Languages, n.d. p. 53). This constitutes the rationale for what Marxists are pleased to call the "partisan character of science."

"We know something of the effects of this kind of partisanship in science. Genetics, as a science, has all but been abolished in the Soviet Union (*cf.* Huxley, *Soviet Genetics and World Science: Lysenko and the*

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Meaning of Heredity, London, Chatto and Windus, 1949)—physical anthropology finds itself trammelled by a notion of "anthropogenesis" which rests inextricably on the Lamarckian crotchet of the inheritance of acquired characteristics (*cf.* Nesturkh, *The Origin of Man*, Moscow, Foreign Languages, 1959, particularly pp. 13, 29, 209, 281)—not to speak of physics which is bedeviled by Lenin's dicta concerning the "real" nature of time and space (*cf.* Stern, *Erkenntnistheoretische Probleme der modernen Physik*, Berlin, Aufbau, 1952). All in the service of proletarian revolution.

While it would not be legitimate simply to dismiss the work of Marxist scholars—a substantial amount of circumspection, it would seem, is required in assessing their work. This is as true of Marxists in the West as it is of Marxists in the East. Similarly, academicians in the West who rest their case heavily on Marxist texts, whatever their source, are legitimately suspect. For Marxists are self-confessed partisans, their "science" subordinate to an extrascientific commitment which can hardly do less than make askew their analysis, weigh their data, hinder free inquiry and distort their conclusions.

A. JAMES GREGOR.

MEN, ANTS AND ELEPHANTS: SIZE IN THE ANIMAL WORLD

By Peter K. Weyl, with illustrations by Anthony Ravielli. Phoenix House Ltd., London, 1961. Pp. 103. Price 12s 6d.

Dr Weyl discusses the range of size and how it affects an animal's efficiency. The living creatures obey a law of size. While there are short men and tall men their ranges are relatively trivial compared with those among other living things and the author argues that the reason for this is that there is a right size for man. He shows that there is a right speed at which to move the legs if fatigue is to be avoided, and the rate at which the legs move will depend on their length.

One important fact is that small animals in order to keep warm have to eat considerably more than larger ones. In the case of man, if he were not his present size but much smaller civilization could not have been created at all; his time would have been taken up in obtaining and consuming comparatively much more food than is necessary at his present size. If man were considerably larger than he is he would have been too clumsy, since it is only in the ocean that great weight can be easily sustained.

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